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LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 35

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CONTENTS

BIOCHEMISTRY

- Effect of Photooxidation on Biological Properties
of Botulin Neuotoxin Type A
(V. A. Kolesnikova, et al.; BIOKHIMIYA, Jan 83)..... 1

- Textural Analysis in Cytophotometric Studies on
Acetylcholinesterase Activity in Autonomic
Ganglionic Neurons
(V. I. Lashpa, V. Ye. Chelubeyev;
DOKLADY AKADEMII NAUK BSSR, Jan 83)..... 2

BIOPHYSICS

- Detection of Electric Discharges by Lorenzini
Ampullae of Marine Fish
(V. D. Baron, et al.; DOKLADY AKADEMII
NAUK SSSR, Aug 82)..... 3

- EEG Studies of Cerebral Cortex in Man in
Acquisition of Visual-Motor Task-Solving Skills
(O. A. Pokolyukhina, N. Z. Kaygorodova;
VESTNIK LENINGRADSKOGO UNIVERSITETA: BIOLOGIYA,
Aug 82)..... 3

BIOTECHNOLOGY

- Electrophysiological Study of Olfactory Reception in Fish
(L. A. Narimanyan; BIOLOGICHESKIY ZHURNAL
ARMENII, Nov 82)..... 5

ENVIRONMENT

Application of Laboratory Studies in Noise Pollution Control (G. Sapunova; LENINGRADSKAYA PRAVDA, 5 Feb 83).....	6
Meeting of WHO Working Group Drawing Up Recommendations 'Rational Basis for Adopting Decisions on Protecting the Population in the Event of Accidental Ejection of Radioactive Substances into the Atmosphere by Nuclear Installations' (A. A. Moiseyev; MEDITSINSKAYA RADIOLOGIYA, Oct 82).....	8
Ways of Artificially Changing Population Structure Among Small Mammals (S. A. Shilova; BYULLETEM' MOSKOVSKOGO OBSHCHESTVA ISSPYTATELEY PRIRODY. OTDEL BIOLOGICHESKIY, Nov-Dec 82).....	9
Age Factors in Artificial Radionuclide Content and Internal Beta Radiation Dose in Roach Rutilus Rutilus (L.) and Bream Abramis Brama (L. Cyprinidae) (L. I. Piskunov, et al.; VOPROSY IKHTIOLOGII, Nov-Dec 82).....	9

EPIDEMIOLOGY

Infectious Diseases Evoked by Conditionally- Pathogenic Bacterial Flora (S. D. Nosov; SOVETSKAYA MEDITSINA, Sep 82).....	11
Effectiveness of Chronic Brucellosis Treatment at the Kayakent Health Resort (M. A. Chililov; SOVETSKAYA MEDITSINA, Sep 82).....	11
Intraspecies Taxonomy of Tularemia Pathogen Francisella Tularensis McCoy ET Chapin (N. G. Olsuf'yev, I. S. Meshcheryakova; ZHURNAL GIGIYENY, EPIDEMIOLOGII, MIKROBIOLOGII I IMMUNOLOGII, 1982).....	12
Some Immunological Aspects of Pseudotuberculosis (Far- Eastern Scarlet Like Fever) (N. N. Besednova, G. P. Somov; ZHURNAL GIGIYENY, EPIDEMIOLOGII, MIKROBIOLOGII I IMMUNOLOGII, 1982).....	12
Role of Ixodes Ticks in Dissemination of Arbovirus Infections (A. Berdyyev, et al.; ZDRAVOOKHRANENIYE TURKMENISTANA, Feb 82).....	13

GENETICS

Medical Agricultural and Industrial Application of Genetic Engineering (Tomas Tikhonenko; SOVETSKAYA LATVIYA, 29 Jan 83).....	14
Role of Enzymes in Health Care and Genetic Engineering (S. Mikhailov; GUDOK, 10 Feb 83).....	17
Nucleo-Cytoplasmic Interrelationships and RND Transport (A. V. Likhentshteyn, V. S. Shapot; USPEKHI SOVREMENNOY BIOLOGII).....	19
Immunoglobulin Genes (Ye. V. Sidorova; USPEKHI SOVREMENNOY BIOLOGII).....	19
Synthesis, Cloning and Sequence Determination of Siberian Salmon Preproinsulin cDNA (V. M. Kavsan, et al.; MOLEKULYARNAYA BIOLOGIYA, Jan-Feb 83).....	20
Induction of Directed Mutations in Plasmid pBR322 Tetracycline Resistance Gene by Hybridization With Complementary Alkylated Single-Strand DNA Fragments (A. V. Mazin, et al.; DOKLADY AKADEMII NAUK SSSR, Feb 82).....	20
Comparison of Characteristics of Human Interferon F(α) and Hybrid Interferon F/D Produced via Recombinant Bacteria With Human Leucocyte Interferon (Yu. A. Ovchinnikov, et al.; DOKLADY AKADEMII NAUK SSSR, Feb 83).....	21
Secondary Development of Spliced Transposons (S. Ye. Bresler, et al.; DOKLADY AKADEMII NAUK SSSR, Aug 82).....	22
Inhibition of Ampicillin Transposon Tn1 Translocation by F Plasmid of Escherichia Coli K-12 (Z. F. Ismailov, et al.; DOKLADY AKADEMII NAUK SSSR, Aug 82).....	22
Role of Direct and Inverted Repeats in Transformation of Bacillus Subtilis by Plasmid DNA (M. Ya. Khaykinson, et al.; DOKLADY AKADEMII NAUK SSSR, Aug 82).....	23
"Recollection" of Previous Integration Site by Transposon (S. Ye. Brelser, et al.; DOKLADY AKADEMII NAUK SSSR, Dec 82).....	23

Integration of Prokaryotic Gene Expressed into Yeast Chromosome (I. A. Zakharov, et al.; DOKLADY AKADEMII NAUK SSSR, Dec 82).....	24
Transformation of Chinese Hamster Cells With pBr325::tk::HS3 Plasmid and Effect of Tumor Promotor TPA on Stability of Transformants (O. K. Glebov, et al.; DOKLADY AKADEMII NAUK SSSR, Dec 82).....	25
HUMAN FACTORS	
Important Aspects of Mental Hygiene in Sports Medicine (I. P. Volkov, A. G. Dembo; TEORIYA I PRAKTIKA FIZICHESKOY KUL'TURY, Jan 83).....	26
Medicopedagogical Aspects of Macro- and Microtrauma of Knee Joint Extensor Apparatus (V. F. Bashkirov, et al.; TEORIYA I PRAKTIKA FIZICHESKOY KUL'TURY, Jan 83).....	26
LASER EFFECTS	
Conference on Coordination of Research in Laser Applications in Medicine (N. F. Shaposhnikova, V. I. Klepikov; SOVETSKAYA MEDITSINA, Sep 82).....	28
Briefs	
Laser Against Pain.....	30
Helium-Neon Laser Treatment of Degenerative and Dystrophic Spinal Diseases.....	31
MEDICAL DEMOGRAPHY	
Working Capacity of Female Machine-Tool Operators of Pension Age (L. B. Pavlova; GIGIYENA TRUDA I PROFESSIONAL'NNYE ZABOLEVANIYA, Dec 82).....	32
Socioeconomic Significance of Public Health Clinics (I. I. Fel', et al.; AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL, Sep 82).....	38
MEDICINE	
Prevention of Chronic Noninfectious Diseases (M. Zaicauscas; SOVETSKAYA LITVA, 5 Jan 83).....	43
Results and Prospects for Studies of Functional Specialization of Cerebral Hemispheres in Man (A. A. Krauklis; IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR, Oct 82).....	46

Use of Sorbent Blood in Surgery (Ye. D. Buglov, S. I. Dovgalev; VESTNIK KHIRURGII, Oct 82).....	47
Organization and Monitoring of Specialist Knowledge in Nuclear Medicine (Yu. N. Kasatkin, F. F. Krotkov; MEDITSINSKAYA RADIOLOGIYA, Oct 82).....	47
Mathematical Training for Nuclear Medicine Specialists (Yu. N. Kasatkin, et al.; MEDITSINSKAYA RADIOLOGIYA, Oct 82).....	48
Some Indices of Lipid Metabolism Among Obese Pregnant Women and Their Newly-Born Offspring (N. S. Lutsenko; ZDRAVOOKHRANENIYE, Sep-Oct 82).....	49
Optimization of Patient Treatment With Magnetic Apparatus (S. M. Agzamkhodzhayev, et al.; MEDITSINSKIY ZHURNAL UZBEKISTANA, Nov 82).....	49
MICROBIOLOGY	
Brief Bacteria Against Carcinogens.....	50
MILITARY MEDICINE	
New Noise Standards for Marine Ships (I. I. Varenikov, et al.; GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA, Dec 82).....	51
PHARMACOLOGY AND TOXICOLOGY	
Effect of Some Arthropod Venoms on Cockroach (Peruplaneta Americana L.) Neurons (A. Mamatkadirov, et al.; DOKLADY AKADEMII NAUK SSSR, Aug 82).....	56
Effect of Δ 9-Tetrahydrocanabinol on Differentiation of Visual Stimuli by Cats (A. I. Machula, N. K. Barkov; FARMAKOLOGIYA I TOKSIKOLOGIYA, Sep-Oct 82).....	56
Further Investigation and Comparative Characteristics of Potential Stimulators of Higher Nervous Activity (V. M. Vinogradov, A. T. Grechko; FARMAKOLOGIYA I TOKSIKOLOGIYA, Sep-Oct 82).....	57
Some Aspects of Development of a Psychosis Model in Rats Exposed to Intracerebral Administration of Lysergic Acid Diethylamide (F. P. Krendal', A. N. Kudrin; FARMAKOLOGIYA I TOKSIKOLOGIYA, Sep-Oct 82).....	58

PUBLIC HEALTH

Decreasing Incidence of Occupational Disease (N. F. Izmerov, A. I. Korbakova; GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA, Dec 82).....	59
Industrial Health Inspection in the RSFSR (K. I. Akulov, I. V. Gerasimova; GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA, Dec 82).....	64
60th Anniversary of Formation of USSR and Successes in Development of Soviet Public Health (S. Ya. Chikin; SOVETSKAYA MEDITSINA, Dec 82).....	69
Status of and Prospects for Development of Outpatient Polyclinic Facilities for Rural Population in Moscow Oblast (L. A. Korshinskiy, N. A. Katuntseva; SOVETSKAYA MEDITSINA, Dec 82).....	78
School for Scoliosis Sufferers (A. Kobets; LITERATURNAYA GAZETA, Feb 83).....	83
Mother and Child Health (T. Chesanova; LENINGRADSKAYA PRAVDA, 16 Jan 83).....	85
Role of Public Health in 26th CPSU Congress Social Program (K. K. Kuz'min; SOVETSKAYA MEDITSINA, Nov 82).....	87
Chest Surgery Center Opens in Tbilisi (A. Malyugina, Prof. V. Pipiya; ZARYA VOSTOKA, 10 Feb 83).....	92
Shifts in the Composition and Fertility of Rural Population in Kighizia and Its Sanitary Significance (K. D. Abdullin; ZDRAVOOKHRANENIYE KIRGIZII, Nov-Dec 82).....	94
Development of Soviet Public Health After 26th Party Congress (S. P. Burenkov; MEDITSINSKAYA SESTRA, Aug 82).....	99
Public Health in the Village (N. Malov, V. Churakov; PLANOVYE KHOZYAYSTVO, Feb 83).....	107
Mother and Child Health Care in the Tatar ASSR (G. A. Bardina; KAZANSKIY MEDITSINSKIY ZHURNAL, Jul-Aug 82).....	115
Characteristics of Toxicosis During Hypervitaminosis D (A. G. Loseva; KAZANSKIY MEDITSINSKIY ZHURNAL, Jul-Aug 82).....	121

- Personal Physician in the Village
(O. Frantsen; PRAVDA, 14 Feb 83)..... 124
- Mortality Analysis Among Children Caused
by Burn Trauma
(U. B. Bayzakov, et al.; ZDRAVOOKHRANENIYE
KIRGIZII, Jul-Aug 82)..... 124
- Confrontation With Aging Disease
(V. A. Almazov; LENINGRADSKAYA PANORAMA, Nov 82)..... 125

RADIATION BIOLOGY

- Assuring Radiation Safety in Use of Nuclear Power
in National Economy
(V. Schtregober; EKONOMICHESKOYE SOTRUDNICHESTVO
STRAN-CHLENOV SEV, Sep 82)..... 126

BIOCHEMISTRY

UDC 577.352.3

EFFECT OF PHOTOOXIDATION ON BIOLOGICAL PROPERTIES OF BOTULIN NEUROTOXIN TYPE A

Moscow BIORKHIMIYA in Russian Vol 48, No 1, Jan 83 (manuscript received 9 Dec 81)
pp 33-39

KOLESNIKOVA, V. A., SHIBAYEVA, I. V. and IVANOV, K. K., Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] The relation between photooxidative degradation of histidine and tryptophan residues and changes in biological properties was studied in partially purified and homogeneous neurotoxin type A from *Clostridium botulinum*. Differential spectrophotometry was used to detect oxidation of tryptophan (peak at 240 nm and minimum at 270-280 nm) in the presence of methylene blue during photooxidation at concentrations not less than 0.1 mM. Since both tryptophan and histidine were found to absorb at 240 nm, diethyl pyrocarbonate, which reacts specifically only with histidine, was used to determine histidine after photooxidation at concentrations less than 0.1 mM. Model experiments with bovine serum albumin demonstrated that oxidation of tryptophan can be determined from differential spectra even at concentrations of ~0.004 mM, and modification of histidine from the reaction with diethyl pyrocarbonate. Photo-oxidation of the botulin toxin complex for 30 min, 1 hr and 1.5 hr reduced its toxicity by 50%, 75% and 95%, respectively, as demonstrated in tests on mice. Highly purified neurotoxin retained 60% of its toxicity after 30 min of photo-oxidation and only 1-3% after 3 hr. Differential spectra of the toxin complex and purified neurotoxin were characterized by a greater minimum at 280 nm and noticeable increase in absorption at 240 nm. The decline in toxicity was related to oxidation of a single tryptophan residue. This was supported by findings from direct chemical modification of one tryptophan residue, which reduced toxicity by 99%. Five-six histidine residues were oxidized in the toxin molecule during photooxidation; six-seven histidine residues were found in comparison with the 11-13 residues in the original toxin. Direct chemical modification of five histidine residues by diethyl pyrocarbonate resulted in retention of 25-30% of toxicity. The effect of histidine residues specifically

on biological properties could not be determined by photooxidation, since tryptophan residues were also oxidized under the given conditions. The possible effect of tyrosine on toxicity was excluded, since tyrosine was not oxidized under the experimental conditions (below 18°C). The retention of antigenic properties and molecular conformation indicates that the antigenic determinant in the first and second toxin fragment is not altered by photooxidation.

Figures 7; references 11: 8 Russian, 3 Western.

[297-9307]

UDC 621.89.576.31:578.086

TEXTURAL ANALYSIS IN CYTOPHOTOMETRIC STUDIES ON ACETYLCHOLINESTERASE ACTIVITY IN AUTONOMIC GANGLIONIC NEURONS

Minsk DOKLADY AKADEMII NAUK BSSR in Russian Vol 27, No 1, Jan 83
(manuscript received 15 Jun 82) pp 82-85

LAPSHA, V. I. and CHELUBEYEV, V. Ye., Institute of Physiology, Belorussian
SSR Academy of Sciences

[Abstract] The Leitz TAS system was employed for textural analysis in studies on acetylcholinesterase activity of autonomic ganglia in the cat. The mathematical program for the combination of textural analysis with cytophotometric techniques led to the determination in individual neurons of the cytoplasmic area, nuclear area, nucleus:cytoplasm ratio, and the optical density of the precipitated acetylcholinesterase. Distribution of activity among the cells was plotted as a histogram of the optical density in relation to the neurons.

Figures 2; references 5: 1 Russian, 4 Western.

[305-12172]

BIOPHYSICS

UDC 591.17.175.1

DETECTION OF ELECTRIC DISCHARGES BY LORENZINI AMPULLAE OF MARINE FISH

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 265, No 4, Aug 82
(manuscript received 9 Mar 82) pp 990-993

BARON, V. D., BROUN, G. R., MIKHAYLENKO, N. A. and ORLOV, A. A., Institute of Evolutionary Morphology and Evolution of Animals imeni A. N. Severtsov, USSR Academy of Sciences, Moscow; Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad; Karadagsk Branch, Institute of the Biology of Southern Seas, UkrSSR Academy of Sciences, Karadag, Crimean Oblast

[Abstract] The title study is carried out by measuring the impulse reaction of individual nerves servicing the Lorenzini ampullae during an electrical discharge. The electrical organs, during a gentle agitation of the dorsal surface of the skate, generate relatively stable discharges having an amplitude of 50-60 mV and a duration of 300-800 msec. Also monitored were other nerves in the skate which produced the electrical discharge and those of another skate positioned close to the first skate. These and other similar experiments suggest, but do not prove conclusively, that the weak electrical discharges are used for electrolocation and electrocommunication. Figures 2; references 9: 6 Russian, 3 Western.

[78-12027]

UDC 612.822.3.087

EEG STUDIES OF CEREBRAL CORTEX IN MAN IN ACQUISITION OF VISUAL-MOTOR TASK-SOLVING SKILLS

Leningrad VESTNIK LENINGRADSKOGO UNIVERSITETA: BIOLOGIYA in Russian No 15, Issue 3, Aug 82 (manuscript received 3 Dec 81) pp 59-67

POKOLYUKHINA, O. A. and KAYGORODOVA, N. Z.

[Abstract] A dynamic study was made of individual features of changes in the activated cortical structure in man during the acquisition of visual-motor task-solving skills. Investigations were conducted in 12 subjects aged 22-30

using a 16-channel EEG machine ("Biofisprbor"), with biopotentials measured from four symmetric cortical areas in the left and right hemispheres in the prefrontal zone (field 46), lower central (field 44), parietotemporal zone (field 37 and part of field 39), and the secondary visual zones (field 9). The magnitude of activation locally was assessed statistically using repeated short functional tests with the eyes opened and closed. In all subjects, left and right hemisphere activity differed; alpha rhythms were most marked in the occipital and parietotemporal zones. Analysis of the findings made it possible to distinguish two groups of subjects: the first (most subjects) included those in whom successful acquisition of skill was observed, with task-solving time reducing in repeat experiments; the second group included subjects (1) unable to acquire this skill. Cortical activity varied as a function of the initial cortical state at rest. Analysis of the distribution of frontal-occipital, unevenness showed that it was reduced more in subjects with right-hemispheric prefrontal dominance than in those with left-hemispheric dominance. The findings are discussed extensively from the viewpoint of individual differences found in subjects. It is suggested that simple visual-motor tasks can be used to clarify the degree of permanence in individual skill acquisition involving dominant activated cortical areas as a direct function of success in skill acquisition. Figures 2; references 30: 27 Russian, 3 Western.

[257-9642]

BIOTECHNOLOGY

UDC 612.86

ELECTROPHYSIOLOGICAL STUDY OF OLFACTORY RECEPTION IN FISH

Yerevan BIOLOGICHESKIY ZHURNAL ARMENII in Russian Vol 35, No 1, Nov 82
(manuscript received 27 Apr 82) pp 899-903

NARIMANYAN, L. A., Sevan Hydrobiological Station, Armenian SSR Academy of Sciences

[Abstract] Olfactory reception was studied in carp and "Lake Sevan khramulya" at the Sevan Hydrobiological Station in 1980-1981 for possible use in biological monitoring of lake water quality. Changes in amplitude and frequency of bioelectrical responses were recorded on an oscillograph from the forebrain surface of carp during prolonged stimulation of olfactory receptors with 0.1% acetic acid solution. Response amplitude and frequency changed periodically with alternation of peak increases and declines; those changes were related to stimulant concentration. Amplitude reached a maximum (128.5 uV) after 18.5 s; impulse frequency tended to increase and vary in the range of 10 to 16.5 impulses/s. Generally, an increase in signal amplitude was accompanied by an increase in frequency, and vice versa. In the "khramulya" impulse activity was recorded from the olfactory tract after removal of the myelin sheath and section of the tract. Rhythmic fluctuations in potential, not synchronized with respiratory activity, were recorded in addition to typical background activity. When the chemical stimulus was used, impulse activity was superimposed on the rhythmic fluctuations in potential. Tapwater provoked infrequent asynchronous impulses, and acetic acid low-amplitude impulse activity after section of the olfactory tract. This spontaneous and evoked impulse activity in the olfactory tract indicates the inhibiting effect of the forebrain on the olfactory analyzer, which must be considered in electrophysiological studies on olfactory receptor response. Figures 2; references 23: 10 Russian, 13 Western.

[300-9307]

ENVIRONMENT

APPLICATION OF LABORATORY STUDIES IN NOISE POLLUTION CONTROL

Leningrad LENINGRADSKAYA PRAVDA in Russian 5 Feb 83 p 4

[Article by G. Sapunova: "Quiet Machines"]

[Text] Noise pollution...This combination of words somehow grates on the ear, doesn't it? Formed contrary to any logic of the Russian language, it has already become a permanent part of the lexicon of specialists, as it determines the reverse side of the scientific-technical revolution. Coming about in the era of the NTR [Scientific-Technical Revolution?], this phenomenon must also disappear in the same era. Prominent scientific institutes, enterprises, and organizations have channelled their efforts to control it.

The noise control laboratory of the Department of Labor Safety Procedures of the Leningrad Institute of Railroad Transport Engineers is one of the leaders in the area of construction machine acoustics. It is here that they deal with, of course, problems of main rail lines and sometimes with industrial enterprises.

...Five years ago laboratory staff members and senior students set out on an unusual expedition along the main rail lines. The October Railroad Administration had given them the task of creating a noise chart. It was ready immediately--sheets of diagrammed Whatman paper, covered with figures: the painstaking work that had preceded its appearance was evident even to the uninitiated.

Laboratory workers armed with noise gages measured the noise level at a distance of 100 meters from the railbed in populated areas. It was necessary to take tens of thousands of measurements at different points to give a detailed picture, to "whisper", the places in which things were not as they should be, and where to first initiate noise control. The primary task has already been completed; the time has come when many numbers on the chart indicating high noise level will be corrected.

Exhibits are now being prepared in the department for the VDNKh (Exhibition of USSR National Economic Achievements), where new "Labor Safety Procedures" and "Environmental Protection" exhibitions are being organized. They will consist not only of procedures in the experimental stages, but also of those that have already been introduced to industry.

A noiseless excavator and compressor, working ever so quietly... a fantasy? No, such machines actually exist already, as inhabitants of the new construction projects in Leningrad can confirm. Construction machines for many purposes, which had given the surrounding area many unpleasant moments, "lost their voices" thanks to the research of the laboratory workers. Low-noise vibrating rollers, road graders, and hydraulic excavators have been dispatched to various enterprises in the country.

"Laboratory staff workers have developed a theory allowing noise to be calculated even at the planning stage," says the chief of the Labor Safety Procedures Department, N. N. Maslov, doctor of engineering sciences. "Machine silence is assured by new standards of calculation, which have become a part of the government industrial standard. Among recent projects the muffler installed in road machinery internal combustion engines can be mentioned: up until now aerodynamic exhaust has been one of the sources of noise in work areas and adjoining zones. Railroad workers have also evaluated the true worth of a new piece of equipment--a unique sonic beam, directing the locomotive signal along the tracks. The rather shrill sound of a siren is now "addressed" only to the person in danger."

Noise pollution is a theme which receives a good deal of attention here. Every year several groups of students embark upon research study: they take readings of noise characteristics and help to compile technical log-books. Participation in these "expeditions" is reflected in graduate studies.

The noise control laboratory is fitted with modern instruments, and its workers are constantly working on new subject matter. Candidate's dissertations are defended here every year. One of the latest studies was on the use of special hoods for noise protection.

"This modern trend," explains laboratory chief N. I. Ivanov, "will help to resolve protection problems more safely. This means to literally put the engine under a cover. Capsules such as this, made of modern polymer materials, can be used in machines for any purpose. They protect safely not only against noise, but also against dust."

[Emphasized test:]--Many laboratory studies have been conducted at a high level. More than 1.5 million rubles have been saved by using them--these are the result of research to solve one of the most important ecological problems--noise pollution.

12262

CSO: 1840/287

UDC 614.73:061.3(100) "1982"

MEETING OF WHO WORKING GROUP DRAWING UP RECOMMENDATIONS 'RATIONAL BASIS FOR ADOPTING DECISIONS ON PROTECTING THE POPULATION IN THE EVENT OF ACCIDENTAL EJECTION OF RADIOACTIVE SUBSTANCES INTO THE ATMOSPHERE BY NUCLEAR INSTALLATIONS'

Moscow MEDITSINSKAYA RADIOLOGIYA in Russian No 10, Oct 82 pp 81-82

MOISEYEV, A. A., Moscow

[Abstract] The 23-27 November 1981 Brussels meeting of the title working committee is described in a two-page report. Details are given of the delegations present, including members of the International Commission for Radiologic Protection. The report presented on the first draft of the title document is summarized. The discussions on the draft are reported. Participants stressed the need to deal with scientific matters; most steps taken so far in various countries have been administrative rather than scientific. Questions of medical responses to accidental ejection of radioactive substances by nuclear installations were extensively discussed at the meeting, and covered topics including shelters for the affected population, the teratogenic effects, prolonged irradiation, and prediction of radiation effects. It was noted that the figures for radiation risk to individual human organs and tissues, as contained in ICRP publications Nos 26 and 27 may be low for some age groups, and it was agreed to incorporate these facts in the final text of the recommendations. Psychological preparation of the public for nuclear accidents is essential, and individuals living close to nuclear power stations should be instructed on what to do in the event of an accident. The next meeting of the working group was scheduled for the second half of 1982. No references.

[308-9642]

WAYS OF ARTIFICIALLY CHANGING POPULATION STRUCTURE AMONG SMALL MAMMALS

Moscow BYULETEN' MOSKOVSKOGO OБSHCHESTVA ISSPYTATELEY PRIRODY. OTDEL BIOLOGICHESKIY in Russian Vol 87, No 6, Nov-Dec 82 (manuscript received 10 May 82) pp 51-57

SHILOVA, S. A.

[Abstract] Ecologic control of processes taking place in animal populations was studied from the viewpoint of artificially-induced changes to clarify characteristics of population homeostasis and to determine ways for controlling the numbers of mammalian pests. The model selected was made up of three species of small mammals distinguished by the spatial and ecologic structure of populations: *Ochotona pricei*, *Citellus undulatus* Pall. and *Meriones unguiculatus*. A series of additional experiments was conducted under laboratory conditions in the wild house-mouse (*Mus musculus* L.). In field work, a total of 1,350 observations was made of 380 marked animals and 2,100 sets of records were compiled. Tranquillizers (aminazin, haloperidol, benactyzine, reserpine and Parnat) were administered in an attempt to reduce aggressiveness in subjects. The findings showed that decreased aggressive behavior by dominant individuals led the only changes in the hierarchy within populations and did not significantly affect earlier population dispersion, thus indicating that other, nonagonistic factors are evidently involved in population homeostasis. Other approaches to this problem are required. References 22: 17 Russian, 5 Western.
[296-9642]

AGE FACTORS IN ARTIFICIAL RADIONUCLIDE CONTENT AND INTERNAL BETA RADIATION DOSE IN ROACH *RUTILUS RUTILUS* (L.) AND BREAM *ABRAMIS BRAMA* (L. CYPRINIDAE)

Moscow VOPROSY IKHTIOLOGII in Russian Vol 22, No 5, Nov-Dec 82
(manuscript received 27 Mar 81) pp 848-856

PISKUNOV, L. I., GONCHAROV, A. I., GUSHCHIN, V. M. and BRONNIKOV, Yu. V., Sverdlovsk Oblast Sanitary Epidemiologic Station; Institute of Biology of Inland Waters, USSR Academy of Sciences, Borok, Yaroslavl Oblast

[Abstract] Determinations were conducted on the artificial radionuclide content, as well as that of K-40, and internal beta irradiation of the roach (*Rutilus rutilus*) and bream (*Abramis brama*) specimens caught in various areas of the Beloyarsk reservoir in the Central Urals. The findings demonstrated that the level radionuclide accumulation was predicated on ecological and nutritional factors. The concentration of Co-60 was greater in the bream (72 pCi/kg) than in the roach (35 pCi/kg), while the levels of Zn-65 and Cs-137 were greater in the roach (5.07 and 264 pCi/kg, respectively) than in

the bream (1.29 and 186 pCi/kg, respectively). However, the mean concentrations of K-40 for the roach (2.31 pCi/kg) and the bream (2.64 pCi/kg) were quite close. Zn-65 and Co-60 accumulation showed a moderate increase with age of the fish. Dosimetric evaluations showed that beta irradiation from K-40 was 10-15% greater in the bream, while total beta dosage from the artificial radionuclides was 5-25% greater in the roach. K-40 accounted for most of the internal beta irradiation (ca. 21 mrad/year); irradiation from the artificial radionuclides came to about 5.97 mrad/year, indicating lack of a health hazard for humans.

References 24 (Russian).

[306-12172]

EPIDEMIOLOGY

UDC 616.98:579.8]-07

INFECTIOUS DISEASES EVOKED BY CONDITIONALLY-PATHOGENIC BACTERIAL FLORA

Moscow SOVETSKAYA MEDITSINA in Russian No 9, Sep 82 (manuscript received 16 Sep 81) pp 72-74

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[Abstract] A brief review is presented of the growing problem of infections involving opportunistic bacteria. The four most commonly encountered situations involve dysbacteriosis due to elimination or suppression of normally dominant flora, clinically or otherwise immunosuppressed host, cases of immune deficiency (congenital or acquired), and iatrogenic manipulations or surgery that may lead to the so-called "auto-infections". Emphasis is placed on the need for more precise epidemiological characterizations of such infections processes and the institution of effective therapy. References 26: 21 Russian, 5 Western.

[241-12172]

UDC 616.98:579.841.93]-036.12-085.838-036.8

EFFECTIVENESS OF CHRONIC BRUCELLOSIS TREATMENT AT THE KAYAKENT HEALTH RESORT

Moscow SOVETSKAYA MEDITSINA in Russian No 9, Sep 82 (manuscript received 30 Apr 82) pp 112-113

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[Abstract] Comparative studies were conducted on the effectiveness of fango-therapy [mud-application], balneofangotherapy, and supportive treatment on the course of patients with chronic brucellosis at the Kayakent health resort (Daghestan ASSR). The most pronounced clinical improvement was seen in patients subjected to balneofangotherapy (a course of 12 mud baths, 7-20 min/day at 37-42°C, plus a course of ten mineral water baths, 10 min in duration, at 38-39°C) both in terms of subjective changes and on the basis of the results of clinical chemistries. References 7 (Russian).

[241-12172]

INTRASPECIES TAXONOMY OF TULAREMIA PATHOGEN FRANCISELLA TULARENSIS MCCOY ET CHAPIN

Prague ZHURNAL GIGIYENY, EPIDEMIOLOGII, MIKROBIOLOGII I IMMUNOLOGII in Russian Vol 26, No 3, 1982 (manuscript received 11 Feb 81) pp 281-291

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[Abstract] The goal of present study was to prove the correctness of intra-species taxonomy of tularemia microbe. In all, 286 strains were examined (217 from the USSR and 69 from abroad) isolated from human sources, rabbits, rats, mosquitoes, etc. The intraspecies differences observed earlier were supported by new findings. None of the 286 strains showed any differences in cultural, morphological properties or serologic activity; none of them fermented glycerine and citrulline. On the basis of some biological differences, three subclasses were identified: *Francisella tularensis holarctica* Ols. (found in the Old and New worlds), *F. t. nearctica* Ols. (known only in North America) and *F. t. mediaasiatica* Aikimb. (found in Central Asia). The holarctic subspecies was further subdivided into biovar *japonic* Rod. (found in Japan), biovar *I ery^s* (spread throughout the old and new worlds) and biovar *II ery^r* (found only in few places in Eurasia). It was argued that in spite of the lack of any serological differences, there were adequate biochemical, pathogenic and distributional variations to propose intraspecies taxonomy for tularemia microbe. References 28: 17 Russian, 11 Western.

[280-7813]

SOME IMMUNOLOGICAL ASPECTS OF PSEUDOTUBERCULOSIS (FAR-EASTERN SCARLET LIKE FEVER)

Prague ZHURNAL GIGIYENY, EPIDEMIOLOGII, MIKROBIOLOGII I IMMUNOLOGII in Russian Vol 26, No 3, 1982 (manuscript received 22 Sep 81) pp 227-233

BESEDNOVA, N. N. and SOMOV, G. P., Scientific Research Institute of Epidemiology and Microbiology, Siberian Branch of the USSR Academy of Medical Sciences, Vladivostok

[Abstract] Evaluation of some humoral and cellular immunity factors of pseudotuberculosis patients was reported. The data showed inadequate immunity of human organism towards pseudotuberculosis infection both on the level of specific (absence of IgM and IgG antibody production) and nonspecific factors (incomplete phagocytic reaction). This could be explained by a tolerance of macroorganism to antigens of *Y. pseudotuberculosis* or by immunosuppressive properties of levomycetin used in the therapy of this disease. Phagocytosis was found to be higher in monocytes than in neutrophils, regardless of the extent of the infectious process. Opsonic properties of blood serum, which intensify during the course of this disease, play an important role in ridding

the organism of pseudotuberculosis bacteria. It was established that the fastest and simplest method of diagnosing pseudotuberculosis is based on indirect hemagglutination reaction. A new diagnostic kit was developed for this purpose. References 10: 7 Russian, 3 Western.
[280-7813]

UDC 595.421:616.988.1

ROLE OF IXODES TICKS IN DISSEMINATION OF ARBOVIRUS INFECTIONS

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 2, Feb 82 pp 3-9

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[Abstract] The involvement of ixodes ticks in the transmission of arbovirus diseases is discussed with emphasis of the danger that this represent for man, particularly in suburban areas. The ixodids present a particular danger to human health, and a special challenge to public health authorities, they function not only in transmission but also as reservoirs of arboviruses since the viruses can be transmitted from generation to generation transovarially. To date, some 16 arboviruses (of the 22 circulating in the USSR) have been isolated from the ixodids in Turkmenia. Consequently, physicians and other medical personnel should be aware of the possibility of arbovirus infections when they encounter cases of favor of uncertain etiology. References 37: 36 Russian, 1 Western.

[245-12172]

GENETICS

MEDICAL AGRICULTURAL AND INDUSTRIAL APPLICATION OF GENETIC ENGINEERING

Riga SOVETSKAYA LATVIYA in Russian 29 Jan 83 p 4

[Article by Tomas Tikhonenko, doctor of biological sciences, deputy director of the Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Science, in the column "Horizons in Science and Technology": "Genetic Engineering"]

[Text] The current scientific and technical revolution is characterized by close ties between science and industry. Biology has also been affected by this movement in a practical direction. This has been borne out by the birth of the microbiology industry during the past decade, by the extensive industrial use of biological catalysts, by successes in breeding producers of antibiotics and of other useful microorganisms, and by biological methods of agricultural pest control. This tendency has been expressed most clearly in the formation of a new branch of applied science, biotechnology, an organic fusion of technical biochemistry, microbiology, and genetic (gene) engineering.

The latter field has evolved with particular intensity. Recently developed from molecular biology and genetics, genetic engineering has had a strong influence on biology, medicine, and the microbiology industry. It can be described as a system of experimental methods using a laboratory method to create artificial genetic structures in the form of so-called recombinant (hybrid) DNA molecules. In this case, reproduction of a number of key genetic processes is accomplished on a molecular level, unlike classic genetics and breeding. An operation which in nature involves the entire organism, takes place in a cell or molecules in the laboratory. Recombination, i.e., the process and result of combining genes into a new entity, takes place in a test tube, at the choice and will of the experimenter.

In our country, genetic engineering has started on its way to practical use. This has occurred extraordinarily quickly, considering the youth of this scientific trend. Results giving rise to discussion on the practical effect of gene engineering have already been obtained. And this is only the beginning.

Medicine will probably be the first field where important changes will take place. For example, genetic engineering methods will make radical improvement of serum-vaccine development possible. At the present time, vaccines are prepared from "killed" or weakened bacteria or viruses. The microorganisms

comprising the vaccine cannot reproduce in principle, but they can induce specific protein antibody formation in humans. This traditional method, however, has its disadvantages. Moreover, the cost of vaccines obtained in this manner has proven extremely high in many cases. It is much safer and more reliable to vaccinate with pure virus protein coats. They are incapable of reproducing in the organism like whole microorganisms, but antibodies are formed in them nonetheless. After the genes of virus protein coats have been built into plasmids (independent genetic elements existing in addition to chromosomes), large quantities of pure virus antigens--ideal vaccination material--can be obtained.

In the last two years Soviet scientists have created recombinant plasmids bearing genes of a number of flu and adenovirus proteins, and they have obtained full or partial DNA copies of genomes (sets of chromosomes) of such viruses as poliomyelitis, foot and mouth diseases, and tick-borne encephalities, etc. Particular attention has been given to flu in this regard, for which economic expenditure has been enormous.

There is one more application of genetic engineering in medicine--obtaining recombinant DNA that can be added to animal genes. By introducing full-fledged functioning genes to defective cell genes, genetic defects such as hereditary human diseases can be corrected. Prospects for curing them are very likely, considering the number of encouraging results obtained by Soviet researchers in the last few years in the study of blood type disorders such as thalassemia and Wilson-Konovalov's disease.

Soviet scientists also hope to solve in this manner the agricultural problem of nitrogen fertilizers. It is extremely important to force such crops as wheat or corn to assimilate atmospheric nitrogen. Nitrogen fertilizers are expensive and are not well assimilated by plants. A significant part of them is broken down by soil microorganisms or carried off into the water supply, where they are converted into dangerous nitrates and nitrites, which are carcinogenic substances in heavy concentrations.

Legumes, living in symbiosis with rhizobia, which are bacteria capable of assimilating nitrogen directly from the atmosphere, suggest a way out of this situation. Therefore, at the present time intensive study is being devoted to transferring a group of genes responsible for binding atmospheric nitrogen to other types of soil bacteria. A project exists which directly transfers these genes to plants. A solution to the problem of biological replacement of nitrogen fertilizer will undoubtedly have a very significant effect from an economic standpoint.

Genetic engineering methods can also be used in the microbiological synthesis of deficient proteins of animal origin, including food and fodder protein. They make it possible to adjust production of certain amino acids represented in plant products in limited quantities. Thus, addition of 0.1-0.3 percent of the deficient amino acid threonine to animal food is known to increase the animals' weight gain by 15-20 percent. By utilizing genetic engineering methods such as these, Soviet scientists have rebuilt the metabolism of intestinal bacilli, increasing their ability to synthesize threonine many times over. As a result, cheap materials for making this amino acid are obtained.

The synthesis of microorganisms for treating industrial and private wastes by genetic engineering methods has a great deal of significance from an environmental protection point of view. To date, bacteria strains which can effectively break down oil and can help to control oil production of the water have been obtained by using recombinant DNA technology. Experiments have been performed for the purpose of creating new forms of recombinant microorganisms capable of decomposing synthetic polymer materials resistant to natural reactions.

In conclusion, research has begun in the area of genetic engineering and been projected far into a future which seems to be almost fantastic at the present time. Some examples of this are: the industrial production of hydrogen using photosynthesizing bacteria, and creation of a molecular diode of microbiological origin, intended to serve as the elementary cell of a super-mini computer of the future, etc. It is here that genetic engineering invades the traditionally nonbiological fields of human endeavor.

12262
CSO: 1840/279

ROLE OF ENZYMES IN HEALTH CARE AND GENETIC ENGINEERING

Moscow GUDOK in Russian 10 Feb 83 p 4

[Article by S. Mikhailov, in the column "Medicine": "Enzymes Are Attacking"]

[Text] Some people have dark skin and others have light skin. Why? The reason is that skin color is a function of the rate at which proteins affecting pigmentation are transformed. This rate is regulated by other proteins--catalysts. They are called ferments or enzymes.

The "field of activity" of enzymes, however, is much more extensive. A deficiency or excess of them causes an upset in substance metabolism, which directly affects human health. Studying enzyme properties and their role in the functioning of various human organs makes it possible to understand the causes of many diseases, including tumor growth and cardiovascular and hereditary diseases.

The Scientific Research Institute of Medical Enzymology was recently created in Moscow. It is headed by the well-known scholar and academician of the USSR Academy of Medical Sciences, S. Debov.

How can medical enzymology affect the practice of health care? It appears that it can not only help physicians in the diagnosis and treatment of disease, but also in the determination of "degree of risk."

A man is admitted to the hospital in serious condition. What is the problem, hepatitis or myocardial infarct? The external symptoms of these diseases are very similar, but the enzymes' spectra for the liver and the cardiac muscle are different. Variations in this same spectrum also permit determination of the exact organ where cellular malfunction occurred.

And there is yet another breakthrough. It has been observed that a healthy person's platelets lack a special enzyme present only in persons suffering from oncologic disease. It has also been noted that during remission of the

disease the number of these enzymes and their activity diminish, and that on the other hand they increase when the disease is exacerbated. These factors permit new diagnostic tests to be devised by medical personnel.

Various enzymes are used therapeutically to treat suppurative illnesses and post-surgical lung adhesions, as well as to dissolve thrombi. A group of scientists have been successful in creating an enzyme capable of curing cardiovascular disease.

And now, concerning "degree of risk": Let us assume that a newly-married couple wants to know how healthy their offspring will be. By using specific enzymes, the doctor establishes that one of the spouses is anemic. The laws of heredity permit him to determine the likelihood of this disease being passed on. It will then be the task of the couple to decide the merits of bringing a baby into a similar situation, considering the degree of known risk.

The range of research conducted by scientists of the Scientific Research Institute of Medical Enzymology is very broad. For example, it is here that they attempt to obtain a group of enzymes which are capable of "cutting off" a separate piece from a specific molecule. Why is this necessary? For genetic engineering--one of the youngest branches of biology.

Let us assume that it is necessary to "cut off" part of a molecule with the necessary gene and "fasten" it to another molecule, introducing it to a chamber of harmless bacteria. You ask, "why?" To obtain several important hormones, such as insulin or growth hormone.

Active work is also being done at the institute on the study of neuropeptides--small molecules possessing a great deal of biological activity. They affect man's mental activity, his emotional realm. Several of them induce sleep, others have an anesthetic effect, and a third participate in blood pressure regulation. If these molecules can be obtained successfully in pure form so as to study their structure, a new class of pharmaceutical agents will be created that are very effective and completely harmless to the organism, since they are manufactured in that very organism.

Many scientific research institutes in our country are busy with enzyme research. The new institute has been charged with directing and coordinating their work, the goal of which is to have enzymes go on the attack against diseases. On the "Gene" complex program alone, scientists at 23 scientific centers are now conducting research.

12262
CSO: 1840/319

UDC 547.96

NUCLEO-CYTOPLASMIC INTERRELATIONSHIPS AND RNA TRANSPORT

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 94, No 1(4) pp 3-20

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[Abstract] A review is presented of the current state of knowledge and various hypotheses dealing with the interrelationships and complementarity of transcription and post-transcriptional factors in gene expression. The latter events appear to play a key role in animal protein synthesis since cytoplasmic mRNA shows much greater specificity than nuclear mRNA and, furthermore, because of the differences in mRNA distribution within the cytoplasma and the existence of cytoplasmic factors which regulate the transport of selected mRNA species into the cytoplasm. The nuclear membrane, while separating the intranuclear and cytoplasmic compartments, appears also to couple and mediate mutual interdependence between these two compartments. References 107: 16 Russian, 91 Western.

[230-12172]

UDC 577.1+576.8.097.3(047)

IMMUNOGLOBULIN GENES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 94, No 1 (4) pp 38-50

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[Abstract] Current state of immunoglobulin genetics is assessed, with emphasis on correlation between immunoglobulin structure and the structure of genes coding for the light and heavy chains. Topics covered include gene interaction and expression to form the different classes of immunoglobulins, switchovers from the synthesis of one immunoglobulin class to another, and recombination of DNA segments underlying the expression of the V genes. Figures 4; references 71: 2 Russian, 69 Western.

[230-12172]

UDC 557.1:597.963.3

SYNTHESIS, CLONING AND SEQUENCE DETERMINATION OF SIBERIAN SALMON PREPROINSULIN cDNA

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 17, No 1, Jan-Feb 83
(manuscript received 16 Feb 82) pp 42-53

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[Abstract] Details are provided of the molecular cloning experiments conducted with preproinsulin (PPI) mRNA isolated from Brockman bodies of the Siberian salmon (*Oncorhynchus keta*), which initially showed that PPI was the primary product obtained with a cell-free wheat germ protein synthesizing system using PPI mRNA (poly(A)-RNA). Subsequently, cDNA was synthesized by reverse transcriptase from the PPI mRNA, and then cleaved with restrictionases for insertion into plasmid pBR322 DNA. The hybrid DNA was then used for the transformation of *E. coli* and amplification of the hybrid plasmid DNA. Following identification of *E. coli* clones carrying the DNA sequence coding for PPI, two plasmids were isolated from the clones and restriction and nucleotide sequence maps of the inserted DNA fragments were determined. The latter information was used to derive the PPI mRNA nucleotide sequence and the amino acid sequence of the PPI molecule. Figures 9; references 35: 4 Russian, 31 Western.

[314-12172]

UDC 547.963.32+578.083

INDUCTION OF DIRECTED MUTATIONS IN PLASMID pBR322 TETRACYCLINE RESISTANCE GENE BY HYBRIDIZATION WITH COMPLEMENTARY ALKYLATED SINGLE-STRAND DNA FRAGMENTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 268, No 4, Feb 82
(manuscript received 16 Aug 82) pp 979-982

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[Abstract] Details are provided for the induction of a directed mutation in the region of the tetracycline resistance gene (Tc^r) of plasmid pBR322, and subsequent testing for mutation by exposing transformed *E. coli* to tetracycline. The approach involved isolating the Tc^r region from plasmid pBR322 DNA by

restrictases, hydrolysis of the fragment with *E. coli* exonuclease III to obtain single-stranded fragments, alkylation of the single-strands and their hybridization with complementary region of pBR322 DNA to yield covalently-bound loops on the genome, i.e., a plasmid with selectively alkylated DNA region (Tc^r). Subsequent *E. coli* transformation experiments established the efficiency of induced Tc^r gene mutation as 0.36%. Figures 2; references 13: 5 Russian, 8 Western.

[316-12172]

UDC 547.963.32

COMPARISON OF CHARACTERISTICS OF HUMAN INTERFERON F(α) AND HYBRID INTERFERON F/D PRODUCED VIA RECOMBINANT BACTERIA WITH HUMAN LEUCOCYTE INTERFERON

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 268, No 4, Feb 83
(manuscript received 25 Oct 82) pp 996-1000

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[Abstract] Tabular data are presented for purposes of comparison of the characteristics of human interferon F synthesized in an *E. coli* system and a hybrid F/D interferon (consisting of the N-terminal part of interferon F (91 amino acid residues) and the C-part of interferon D (75 amino acids)) with human leucocyte interferon. The results showed that the antigenic determinants of F and F/D were essentially identical to that of the leucocyte interferon, but different from β and γ interferons, and showed an antiviral spectrum similar to that of the leucocyte interferon. However, the interferons synthesized in bacteria showed considerably greater stability on exposure to high temperatures and low pH values, which may have been due to the presence of protein impurities in the leucocyte preparation. The bacterial products and the leucocyte interferon were equally well activated by 0.01 M lanthanum chloride, equally potent in activating human killer cells, and showed similar cytotoxicity against HeLa cells. Figures 1; references 9: 1 Russian, 8 Western.

[316-12172]

SECONDARY DEVELOPMENT OF SPLICED TRANSPOSONS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 265, No 4, Aug 82
(manuscript received 9 Mar 82) pp 969-971

BRESLER, S. Ye., TAMM, S. E., GORYSHIN, I. Yu. and LANTSOV, V. A., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences, Gatchina, Oblast

[Abstract] A new phenomenon, termed "post-excision transposition," is described, based on the title experiments. The experimental system used is a variation of the plasmid localization of the transposon Tn10, carrying a determinant stable towards tetracycline (Tet^r). The strain ECK11:F' lac⁺-proA⁻::Tn10/AB1157rec⁺ was constructed in which the transposon Tn10 was attached to the proA gene at the F' lac⁺ proA⁺ plasmid. Cells with pro⁺ and with pro⁺Tet^r increase at the same rate but the latter show an incubation period 12 hours longer than that for the former. The median time for extracting Tn10 from the proA::Tn10 site is about 4 hours and that for the secondary reconstruction of the transposon after excision from the site is about 18 hours. The transposon is almost never destroyed as 99% of the studied pro⁺ clones contain observable numbers of the pro⁺Tet^r cells. Also, suppression of part of the secondary reconstruction occurs rather frequently as cells which result from such suppression show a Gaussian distribution after 16 cell divisions. References 7: 2 Russian, 5 Western.

[78-12027]

INHIBITION OF AMPICILLIN TRANSPOSON Tn1 TRANSLOCATION BY F PLASMID OF ESCHERICHIA COLI K-12

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 265, No 4, Aug 82
(manuscript received 22 Mar 82) pp 972-974

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[Abstract] The title study was carried out in order to evaluate the ability of the E. coli F plasmid to control the frequency of incorporating the ampicillin transposon Tn1. Experimental strains were selected such that when the Tn1 is incorporated into the phage gene, the lysogen bacteria become resistant to ampicillin as well as kanamycin. Identification of the transductants shows that the determinant of the ampicillin resistance is closely associated with those of the phage gene and during subsequent transferral is always transferred together with it to P1 clrl00 Km in other bacteria. Only

one of the evaluated plasmids, pRS2 containing the segment having the F-factor with coordinates 5,3 - 10,4 kb, shows any inhibition on the transposition. The activity appears to lie in the ~~Y~~ element. References 10: 2 Russian, 8 Western.
[78-12027]

UDC 575.114.4

ROLE OF DIRECT AND INVERTED REPEATS IN TRANSFORMATION OF BACILLUS SUBTILIS BY PLASMID DNA

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 265, No 4, Aug 82
(manuscript received 16 Mar 82) pp 975-978

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[Abstract] A method is described for the direct introduction of fragments into the bacillus by using vectors capable of inducing transformations in the bacilli through the monomer DNA. Plasmids with direct repeats were obtained by combining EcoRI segments A and B vector pJJ1 with the EcoRI fragment Rib of Bacillus subtilis DNA. Vector pJJ1 is obtained by adding the plasmids pUB110 and pBR32 to site BamI and permits replication in both Bac. subtilis and E. coli. Segments A and B are genetically expressed through resistance to ampicillin and kanamycin respectively. About 5% of the E. coli clones, called pMX1, are capable of transforming Bacillus. This type of structure is called a "pseudodimer." Inverted repeats have not yet been prepared by this method; however, several experiments with the plasmid pSM19035, which does contain an inverted repeat, indicate that this plasmid is capable of inducing in Bac. subtilis a stability towards erythromycin. Figures 2; references 12: 4 Russian, 8 Western.
[78-12027]

UDC 576.859.9:576.851.48

"RECOLLECTION" OF PREVIOUS INTEGRATION SITE BY TRANSPOSON

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 267, No 6, Dec 82
(manuscript received 11 Aug 82) pp 1468-1471

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[Abstract] One of the interesting properties of postexcisional transposition has been described as a "recollection" of the integration site of a transposon, the so-called "base locus". The difference between a base and an unstable locus

may be determined by presence or absence of the transposon's "structural memory. This memory can be visualized as homologous pairing of some nucleotide sequences of the transposon with sequences of target DNA. Experimentally, an element Tn10 was transposed from a chromosome of the plasmid F' and back to E. coli K-12 cells. The "memory" was registered as follows: from the site srl 300 the element Tn10 was transposed to the base site F'; after excision from that site, Tn10 was transposed to the chromosome and from these secondary sites back to F'. Analysis of experimental data showed that the transposon was capable of remembering the site of its insertion. The structural memory phenomenon exhibited by the transposon could be one of the more important properties of migrating elements, making them useful in control of cell or organism viability. References 12: 2 Russian, 10 Western.

[228-7813]

UDC 575.24:576.85

INTEGRATION OF PROKARYOTIC GENE EXPRESSED INTO YEAST CHROMOSOME

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 267, No 6, Dec 82
(manuscript received 16 Aug 82) pp 1478-1480

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[Abstract] The goal of the present study was to achieve a stable integration into yeast chromosome of an "episomal" plasmid pYF91 carrying the prokaryotic β -lactamase bla gene expressed in yeasts. The transformation method for the yeast cells, hybridization and tetrade analysis of yeast hybrids were done by standard methods. The ability of yeast cells to secrete β -lactamase into the medium was determined by the starch iodide method. Genetic analysis of the results showed inclusion of "episomal" plasmid pYF91 into III yeast chromosome. It was not clear whether the 2 mcm DNA fragment present in plasmid was also present in the chromosome. Prokaryotic gene bla continued to function in the integrated state and in the meiotic split behaved as a chromosomal locus. When bacterial nif genes (genes of nitrogen fixation) were integrated into yeast chromosome, their expression was not manifested. References 12:

1 Russian, 11 Western.

[228-7813]

TRANSFORMATION OF CHINESE HAMSTER CELLS WITH pBR325::tk::HS3 PLASMID AND
EFFECT OF TUMOR PROMOTOR TPA ON STABILITY OF TRANSFORMANTS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 267, No 6, Dec 82
(manuscript received 18 Jun 82) pp 1496-1498

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[Abstract] Transformation of Chinese hamster tk^- cells was carried out with pBR 325 plasmid containing an insertion of DNA thymidine kinase fragment of Herpes simplex virus [in Bam HI site 3.5 kilo pairs of nucleotides (KPN)] and a fragment of human satellite DNA III (HS3) (in EcoRI site - 1.8 kpn). Southern blot analysis of the chromosomal DNA of transformants isolated from one of a series of experiments showed that EcoRI hydrolysates included fragments 4.4 and 2.1 kpn, characteristic of the starting plasmid pST 826. Hence, pBR 325 sequences were retained in the chromosomal DNA transformants even after 20 cell divisions. Investigation of the presence of plasmid sequences in chromosomal fractions by hybridization technique showed that some of them contain restructured (2T301) or nonrestructured (2K15) fragments of the vector. Comparison of the distribution of EcoRI fragments in chromosomal DNA of the transformants, isolated from another series of experiments after treatment of the tk^- cells with satellite containing plasmid pST 826 and with plasmid containing only tk gene pT 819, showed no significant differences. However, verification of the stability of tk^+ phenotype showed considerable destabilization of tk-gene in clones transformed by pT 819. It was also shown that a 24 hr treatment with TPA, 8-10 hrs after addition of DNA did not change the yield of transformants, while analogous treatment with a nontoxic dose of mitomycin C completely suppressed the yield of the transformants. TPA evidently leads to destabilization of tk gene long after treatment (more than 20 divisions). This destabilization may be connected with a loss of tk gene from the transformants or with some disruption of the expression. Figures 3; references: 13 Western.
[228-7813]

HUMAN FACTORS

IMPORTANT ASPECTS OF MENTAL HYGIENE IN SPORTS MEDICINE

Moscow TEORIYA I PRAKTIKA FIZICHESKOY KUL'TURY in Russian No 1, Jan 83 pp 13-16

VOLKOV, I. P. and DEMBO, A. G., State Order of Lenin and Order of Labor Red Banner Institute of Physical Culture imeni P. F. Lesgaft

[Abstract] The development of sports medicine and the increasing acceptance of sports as a science in itself, as well as the constant striving for new records in physical achievement, has resulted in more in-depth studies on the mental hygiene of sports. It has come to be appreciated that considerable mental problem may arise as a result of constant striving for perfection, competitive tension, and over-training. Evaluation of the various neurotic conditions to which athletes are prone as a result of excessive and improper physical training has in turn led to the appreciation of the psychosomatic aspects of sports. The creation of an environment for optimum mental health among athletes will require greater cooperation and understanding among trainers, athletes, psychologists and sports physicians. References 13 (Russian).

[313-12172]

MEDICOPEDAGOGICAL ASPECTS OF MACRO- AND MICROTRAUMA OF KNEE JOINT EXTENSOR APPARATUS

Moscow TEORIYA I PRAKTIKA FIZICHESKOY KUL'TURY in Russian No 1, Jan 83 pp 16-19

BASHKIROV, V. F., GRACHEV, V. M. and RUBIN, V. S., All-Union Scientific Research Institute of Physical Culture; Moscow No 1 Therapeutic-Physical Culture Dispensary

[Abstract] An analysis was made of 361 cases of complaints by athletes about knee pain, discomfort, and limited range of motion of the knee joint, in order to determine primary causes of such musculoskeletal pathology and methods of prevention and treatment. The results showed that over 55% of the cases involved young and inexperienced athletes 16 to 23 years of age. Highly qualified athletes accounted for only 19.94% of such cases. Breakdown as to sports revealed that track and field sprints and jumps were responsible for

38.4% of the cases, volleyball for 15.2%, skiing for 14.6%, a-1-around athletic events for 6.8%, basketball for 6.8%, wrestling for 6.4%, and heavy athletics for 5%. The key to prevention of such knee injuries rests on graded training routines allowing for gradual adaptation to a given type of athletic activity. Figures 4; references 12 (Russian).

[313-12172]

LASER EFFECTS

UDC 615.849.19:001.8:061.3"1981"

CONFERENCE ON COORDINATION OF RESEARCH IN LASER APPLICATIONS IN MEDICINE

Moscow SOVETSKAYA MEDITSINA in Russian No 9, Sep 82 pp 122-123

[Article by Doctor of Medical Sciences N. F. Shaposhnikova and V. I. Klepikov, deputy director of technical administration, USSR Academy of Medical Sciences, Moscow]

[Text] The volume of research in the use of laser emission in medicine and biology has been expanded significantly in our country during the past few years. The decisions of the 26th CPSU Congress planned further development of laser technology during the 11th and 12th Five-Year Plans. A conference was held at Saratov to solve problems of coordination of scientific research related to laser applications in medicine and biology and promising evaluation of laser medical equipment and support of scientific and practical health institutions with new special lasers. Its organizers were the section on the use of laser emission in medicine attached to the scientific and technical council of the USSR Academy of Medical Sciences and the Interdepartmental Coordinating Committee on Quantum Electronics. Prominent scientists and specialists from Moscow, Alma-Ata, Lvov, Ryazan, Leningrad and other cities participated in the work of the conference.

At the opening of the conference, the head of the Saratov Medical Institute, corresponding member of the USSR Academy of Medical Sciences N. R. Ivanov noted the important contribution of specialists of the medical institute, the university and therapeutic institutions in solution of this future problem. It was emphasized that Saratov has become one of the most prominent peripheral centers for the use of lasers in medicine.

The chairman of the problems committee on laser application in medicine of the USSR Academy of Medical Sciences Doctor of Medical Sciences A. K. Polonskiy thoroughly analyzed the status of the problem and prospects for development of laser medicine in our country and abroad and the problems of coordination of scientific research and developments and introduction of the advances of science into practical health. The reporter noted the important contribution of Soviet scientists to study of the biological effects of laser emission and the use of lasers in various fields of medicine. A. K. Polonskiy dwelled on problems of training medical and engineering specialists in the field of using laser emission in medicine by creation of special methods-training centers at Moscow, Saratov and Alma-Ata at bases of scientific research and medical

institutes that regularly hold conferences, topical seminars and schools. The new capabilities of using low-intensity laser emission for therapeutic purposes in combination with other physical factors, specifically, magnetic and laser therapy and the use of semiconductor lasers, attracted the attention of specialists. Professors S. D. Pletnev, V. N. Koshelev and D. L. Korytnyy, Candidate of Medical Sciences M. P. Nikolayev and others gave reports in the field of laser applications in oncology, surgery, dermatology, stomatology and otolaryngology.

The reports of Candidate of Medical Sciences V. A. Kashuba and Doctor of Technical Sciences A. I. Soklakov were devoted to solution of the practical aspects of labor hygiene and dosimetry in working with lasers. The attention of the listeners was directed toward the timely problem of labor protection of medical workers. The advantages and characteristics of specific models of laser units for diagnosis and surgery, laser therapy in treatment of trophic ulcers, stomatitis, parodontitis and other diseases were discussed with great interest.

The participants of the conference pointed out the need to coordinate the development and production of laser equipment for medical purposes with the scientific and technical council of the USSR Academy of Medical Sciences and were familiarized with the organization and work of the laser laboratory (head--Professor V. N. Koshelev) and were present at operations performed using a laser scalpel. The need to train medical and engineering specialists to work with laser units in medicine and biology was emphasised at the conference. It is planned to hold an All-Union Conference of young specialists in the use of lasers in medicine in 1982.

The fruitful work of the conference and the creative contacts of specialists of different profile will stimulate development of the problem, important to medical science and practical health.

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CSO: 1840/242

BRIEFS

LASER AGAINST PAIN--Leningrad--Yet another field has been added to the number of medical "occupations" of the laser. Childhood stomatologists have begun to use lasers successfully. The grief experienced by parents who have found that the teeth of an infant are growing incorrectly is well known. The unpleasantness however can be corrected. The child need only hold a special plate in the mouth for some time and diligently perform exercises for the masticatory muscles--myogymnastics. The teeth are gradually shifted in the necessary direction. And if the infant does not perform the gymnastics regularly, what frequently occurs? It means that one must check in which direction the teeth are shifting so as to correct the situation in time. How is this achieved? The laser has come to assist. A method that permits recording of the slightest, previously undetectable shifts of the teeth has been developed at the Department of Operative Surgery, First Leningrad Medical Institute imeni I. P. Pavlov, under the supervision of Professor O. P. Bol'shakov. Holographic photographs of casts of the jaw are made: one before the course of treatment and the other after a certain time. By comparing both holograms, the orthodontists first achieved the capability of directing subsequent growth of the teeth with high precision. Colleagues of the Department of Childhood Stomatology, headed by Professor M. M. Solov'yev, tested the new method and introduced it into practice. But this is not the only case when childhood stomatologists have used the properties of laser beams. A method of treating osteomyelitis using helium-neon lasers has been developed and assimilated at the department. The use of pulsed lasers, which can replace the drill in some surgical operations that reduce the periods of treating the teeth also opens up great prospects. In this case the youngest patients will not experience pain. [Text] [Moscow PRAVDA in Russian 2 Feb 83 p 6] 6521

UDC 616.711-007.17-085.849.19

HELIUM-NEON LASER TREATMENT OF DEGENERATIVE AND DYSTROPHIC SPINAL DISEASES

Moscow SOVETSKAYA MEDITSINA in Russian No 9, Sep 82 (manuscript received 17 Sep 81) pp 66-68

BOGDANOVICH, U. Ya., KARIMOV, M. G. and KRYLOV, V. Ye., Kazan Scientific Research Institute of Traumatology and Orthopedics

[Abstract] Clinical trials were conducted on the therapeutic efficacy of helium-neon laser (638 nm , $70-100\text{ mW/cm}^2$) in degenerative and dystrophic spinal lesions in 97 males and female patients 25-60 years old. Subjective and objective improvements were obtained in 54 cases after a single course of treatment (12-15 sessions, 3-5 min each), and in 37 patients after two courses (at least one month apart). Six patients with chronic conditions failed to improve after three courses of treatment. Back pain reappeared in nine patients two to six months after the last laser session due to premature return to physical work. On the basis of the observations in this study laser therapy appears to be a promising therapeutic modality in the management of degenerative spinal changes.

References 2 (Russian).

[241-12172]

MEDICAL DEMOGRAPHY

UDC 613.6[621.952+621.924.1/6+621.914.3]-053.9:658.311.44

WORKING CAPACITY OF FEMALE MACHINE-TOOL OPERATORS OF PENSION AGE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NNYE ZABOLEVANIYA in Russian No 12, Dec 82
pp 31-35

[Article by L. B. Pavlova (Barnaul), Altay Medical Institute imeni Leninist Komsomol: "On the Occupational Work Capability of Female Machine-Tool Operators of Pension Age"]

[Text] The utilization of the labor of qualified workers of pension age is of great national economic significance. Many works have been published devoted to the questions of the professional working capability of a number of mass professions of pension age; most of these works examine discrete aspects of the problem. There have been studies on possible adaptations of hemodynamic apparatuses for machine-tool operators between the ages of 40 and 59 (N. N. Kuznetsova), changes in their work capability related to respiratory and metabolic changes that occur with age (Henschel), sensitivity to sound according to age (Plundrich), psychological considerations (Thomae) and illness in the pre-pension age (G. I. Mendrina and coauthors; T.A. Stasevich and coauthors; Fritzsch) and others. In the available literature we did not come across a comprehensive evaluation of the working capacity of female machine-tool operators of pension age as is available for female textile workers, for example (S. M. Bayda and coauthors; N. V. Dolge and coauthors).

The purpose of the work was to study the work capacity and potential labor resources of female machine-tool operators 55 years of age and over and to provide a basis for hygienic measures to increase their work capability.

The study was made in six enterprises of the machine-building industry with a total of about 30,000 female machine-tool operators. A hygienic evaluation of work conditions was made for the most common machine-tool jobs, from which test groups were selected--lathe operators, milling-machine operators, drill operators and grinding machine operators. The groups under study comprised workers aged 45-49 (first), 50-54 (second), and 55-59 (third) who had worked at least 20 years. The preservation of work capability in the female workers was studied according to indicators of health status (200 persons per group), economic and social-psychological work capability (100 persons per group). The characteristics of labor resources in each age group were determined by the percentage of healthy or almost totally healthy individuals with an average or high level of work capability. In order to establish the regimens and work conditions as well as optimal work load for female workers

aged 55 and over an evaluation was made of the physiological value of the work and the dynamics of physiological indicators of work capability in each age group (40 persons per group) during the day and night shifts. The reaction of vegetative functions--ChSSR, arterial pressure--AD, latent reaction time to light--SVRS and noise--SVRZ, strength--Sm and endurance--VM of the wrist were recorded using a portable KTD-1 diagnostic complex (non-standard, Hungarian-made), which enabled us to significantly curtail the time per one study. Other psychophysiological tests (calculation indicators, tremometry, attention) were conducted according to commonly-accepted methods. Grouping according to category of state of health, a point evaluation of indicators and an integral evaluation of work capability were made according to "Methodological Recommendations for the Study of Work Capability of Individuals of Pre-Pension and Pension Age" (Moscow, 1976). The results were processed with statistical methods and a calculation of the confidence coefficient according to Student.

The hygienic characteristics of the industrial environment of mechanical shops included: a microclimate basically adhering to the standards of GOST [All-Union State Standard] SSBT [Further expansion unknown] 12.1.005-75 (temperature--20-26°C, relative humidity--30-69 percent, speed of air movement--0.2-0.6 meters/second). The noise level was 82-99 decibels at 250-4,000 hertz, which exceeds GOST SSBT 12.1-003.76 indicators by 1-9 decibels. The KEO [coefficient of natural light] at machine-tools is 0.6-1.8 percent, general lighting--100-120 lux and combined light--up to 500 lux, i.e. 2-3 times lower than standard according to SN.P 7-4-79 [Further expansion unknown]. Air dust comprised 5.1-13.9 mg/m³, pollution with oily aerosols--7.6-19.4 mg/m³, carbon dioxide--15.4-21.7 mg/m³, sulphur dioxide--4.4-9.2 mg/m³, which is basically within maximal tolerated levels [PDK] according to SN 245-71 [Further expansion unknown], with concentrations above tolerated levels in 4-7 percent of the samples. Shift density (machine and machine-manual time) ranged from 79 to 93 percent.

The work of female machine-tool operators was characterized by monotony, relative hypodynamics with intensive local loads on the muscles of the hands (work operations) and legs (standing while working), as well as visual and neuro-emotional stress related to the rapid work pace. The female workers of the four aforementioned groups work in the same shops, have the same work loads, and fulfill the same operations. Research shows that the differences in the indicators under examination for different jobs are statistically unreliable, and for this reason we are presenting average data obtained for the female workers of various jobs in the same age group.

Health status was evaluated according to incidence of illness with time away from work and the result's of the doctor's examination. An analysis of illness with a temporary period away from work showed that in the 3 years studied the people in the 45-49 year old age group were 45 percent healthy, 12 percent practically healthy and 43 percent weak; in the 50-54 year old age group--44, 11 and 45 percent respectively; and in the 55-59 year old age group--42, 9 and 58 percent respectively. The difference in analogous indicators among groups is statistically unreliable (P less than 0.05). The incidence of sickness with a temporary period of time away from work was

198 times per 100 workers in the first group, 231 times in the second group, 264 in the third. The duration of an illness was 9.3, 10.7 and 16.7 days respectively. The most common chronic diseases included diseases of the peripheral nervous system and neuralgia, bone and muscular diseases, circulation problems (in particular, varicose veins in the lower extremities), and diseases of the urogenital tract, the skin and cellular tissue subcutaneously.

The results that were obtained attest to the absence of a significant difference in indicators regarding the health of female machine-tool operators of pre-pension age and pension age. Among the latter the incidence of illness is greater with more time away from work and an illness of longer duration.

The economic indicators of work capability were evaluated according to the volume of work done and its quality per annual production plan. An analysis showed that the difference in the numbers of times plans remained unfulfilled and in cases of defects for all groups was statistically unreliable. Thus, the proportion of defects in annual production volume was 0.74 percent in the first group, 0.61 percent in the second and 0.67 percent in the third (P less than 0.05); the average quantitative indicators for plan fulfillment were 103.1, 101.2 and 102.9 percent respectively (P less than 0.05).

Socio-psychological indicators of work capability were studied by means of self-evaluation questionnaires and confirmation by the administration. The survey showed that female workers of pension age, as compared with those 45-54 years of age are more satisfied with their work, have a better relationship with the collective and have a lower self-evaluation regarding the relevance of their job, and have the greatest difficulties in fulfilling the plan. According to the attestation of the administration, 63 percent of group one fully conform to their jobs, 41 percent of group two and 49 percent of group three; 28, 44 and 44 percent respectively conform partially; and 9, 15 and 7 percent respectively do not conform at all.

Thus, the work capability of female machine-tool operators does not decrease after age 55; on the contrary, for specific indicators (chronic diseases, work satisfaction, evaluation of administration) this group surpasses the pre-pension age group, apparently in connection with the fact that after age 55 the more healthy and able-bodied continue to work. If we total up points for each group as regards health status and economic and socio-psychological indicators it turns out that the difference in the totals for these three criteria for the female workers of the three age groups under study is statistically unreliable. Consequently, it is possible to provide a general total evaluation of these indicators for the female workers of machine-tool jobs ages 45 and over, including working retirees according to age (let us call this the preliminary evaluation)--68.7 percent of all female workers achieved average totals, 21.3 percent achieved lowered and low totals and 10 percent achieved high totals.

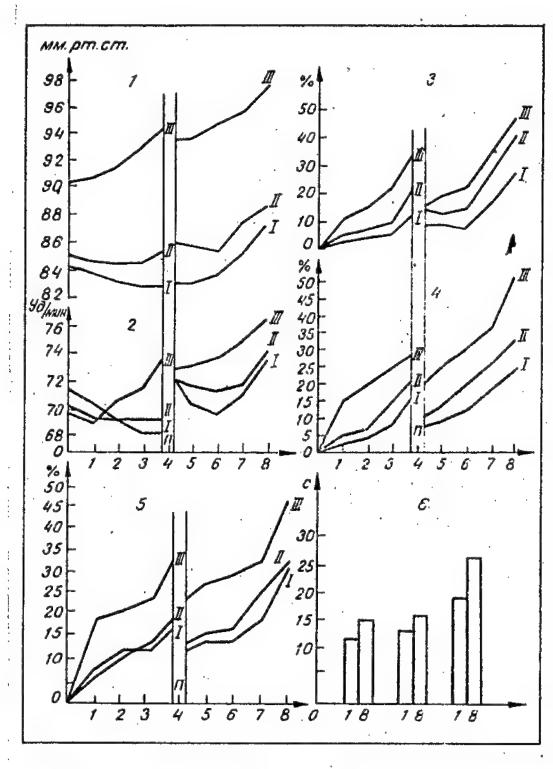
A study of the physiological correlation of work capability showed the same level of functioning of physiological systems in the body in groups one and two and a qualitatively different level in workers of group three.

In the workers of groups one and two an occupational dynamic stereotype is established in the course of a shift, characteristic of monotonous physical labor and stress (curtailment of ChSS, drop in pulse--PD and average dynamic pressure--SDD). There is a phase of stable work capability during which the values for SVRS, SVRZ, Sm and VM remain stable. Fatigue indicators (more frequent ChSS, increased SVRS and SVRZ, decreased Sm, VM and indicator of absolute work capability--PAR and an increase in tangency during tremometry) were highest after 6-8 hours of work. The most significant changes in the work process occur in the indicators for the status of the neuromuscular apparatus of the hands (Sm, VM, PAR, tangency). The difference in ChSS and hemodynamic indicators at the beginning and end of a shift is statistically unreliable, as is the increase in PD in the second group during the night shift. A graph analysis of functional tests is presented here (for data on the morning shift). Non-compensated fatigue in the first and second groups is observed in 27.6 percent of the cases during the morning shift and in 36 percent of cases after the night shift.

In workers of the third group there are changes in intensity of the components of functional systems involved in work. The greatest number of changes occur in indicators for functional stress on the cardiovascular system--ChSS, AD, PD and SDD begin to increase from the second hour of work. Until the third-fourth hour of work the increase in hyperdynamics parallel labor productivity (decrease in the time needed to fulfill one operation and an increase in hourly output). By the end of the fourth hour of work labor productivity begins to drop but functional intensity continues to increase. An increase in PD and SDD, an increased frequency of ChSS toward the end of the morning and night shifts and an increase in systolic AD by the end of the night shift are statistically reliable. The signs of fatigue in female workers of the third group are more explicit and appear at an earlier time during the shift than in the first and second groups (see graphs). The phase of constant work capability is unstable. According to the survey 48 percent of the female workers after the morning shift and 66.7 percent of the female workers after the night shift experience compensatory fatigue. The difference with analogous indicators for the first and second groups is statistically reliable. Thus, the female workers ages 55-59 achieve the same economic results as the female workers ages 45-54 but with a significantly greater physiological change during work, with more stress and fatigue.

An integral point evaluation of the work capabilities of female workers of different age groups, with a consideration of preliminary evaluation and the functional stress on the organism (ChSS, PAR, Gryunbaym test) differs significantly from the preliminary evaluation. Integral indicators for work capability in the first and second groups differ unreliably and can be averaged just as the preliminary evaluation was--63.5 percent of female workers of 45-54 years of age have an average level of work capability, 6.5 percent--increased and high, and 30 percent--lowered and low. In the third group the indicators are reliably lower--53 percent of female workers have an average level of work capability, 47 percent--lowered and low. In the 54-59 age group there are no workers with an increased or high work capability. This data characterizes the potential labor resources of female machine-tool operators over 45 years of age, including workers of pension age.

Dynamics of Functional Indicators in
Female Machine-Tool Operators per Shift



Key to Graphs: Y-axis--indicators of physiological functions; X-axis--hours of work; I--SDD; 2--ChSS; 3--elongation of SVRS; 4--decreased PAR; 5--increase in number of tangents; 6--time needed to complete Gryunbaum test; I--curves characterizing changes within the group of female workers ages 45-49; II--the same for group ages 50-54; III--the same for group ages 55-59; II--lunch break.

Thus, female machine-tool operators ages 55-59 retain their work capability, but the physiological cost of their work is higher than that for workers of pre-pension age; the same work for the different age groups should be characterized by different categories of difficulty and intensity. According to physiological characteristics the labor of female machine-tool operators ages 55-59 approaches the category of heavy labor.

The results that have been obtained attest to the necessity of elaborating a system of hygienic measures for industrial safety for female machine-tool operators who continue to work after the age of 55. This system must be of the dispensary type. There should be annual physicals with therapy (considering the stress on the cardiovascular system during work and potential hypertension) as well as neuropathological, surgical, gynecological and dermatological services (considering the structure of chronic ailments in this

group). Workers with a low work capability must be provided with jobs they can perform. For workers with a lowered work capability health treatment measures are essential. Female workers over 55 should have regulated breaks and should not be allowed to work the night shift. It would be expedient to decrease the work volume(possibly by changing from a piecework to a time payment scale--recommendation of L. V. Donskaya). Work conditions can be improved by organizing separate areas ("oases") for female workers over 55 with optimum parameters for microclimate, lighting, noise, and so forth. Areas for future research include the effectiveness of methods of express-prevention of fatigue in female workers 55 years of age and older through exercise and oxygenation as well as elaborations of methods for post-work rehabilitation (water therapy, exercise).

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SOCIOECONOMIC SIGNIFICANCE OF PUBLIC HEALTH CLINICS

Baku AZERBAYDZHANSKIY MEDITSINSKIY ZHURNAL in Russian No 9, Sep 82 pp 54-57

[Article by I.I. Fel', A. A. Aliyev, and G. L. Truman, Department of Public Hygiene and the Organization of Public Health (directed by Professor I. I. Fel') and Political Economy (directed by Professor A. A. Aliyev) of the Azerbaijan Order of the Labor Red Banner State Medical Institute imeni N. Narimanova (headed by Professor Z. T. Kuliyev): "The Status of Labor Resources and the Socioeconomic Significance of Providing Public Health Clinics for the Entire Population"]

[Text] During the last 15 years the national economy of the USSR has developed under conditions in which there has been a constant growth of labor resources. This was based on the relatively high birth rate during the post-war years. In 1965 the birth rate began to drop in the country as a whole as well as in the Azerbaijan SSR. In 1965 there were 36.6 births per 1,000 population; in 1979--25.0¹ (a drop of 31.7 percent).

During this same period there was a change in the age structure of the population. There has been a growth in the number of people of the older age groups. The number of persons receiving pensions due to age comprised 232,000 persons in 1965 in the Azerbaijan SSR; in 1979--421,000,² i.e. there was an increase of 81.5 percent. In the USSR as a whole the number of people over 70 years of age receiving pensions increased from 40 to 49 million.³

At the 26th congress Comrade L. I. Brezhnev noted, that during the 1980's "certain factors will be operating to complicate economic development. One of them is the curtailment in the growth of labor resources."⁴ For this reason the solutions to a number of urgent national economic problems in the 1980's and the 11th Five-Year Plan will be characterized by some unique features.

In past decades we considered women between the ages of 16 and 55 and men between the ages of 16 to 60 as capable of working. At the present time our calculations are somewhat different--the working life begins at about the age of 20 and concludes several years after retirement age.⁵ On this basis, the increase in the "working age" population during the last 30 years of the 20th century will be as follows (see table).

Population Growth in USSR in Ages 20 to 60
(according to V. Perevedentsev)⁵

Years	Increase over a period of 5 years	
	Millions of persons	Percent
1971-1975	8.5	7.0
1976-1980	13.8	10.6
1981-1985	7.7	5.4
1986-1990	1.0	0.6
1991-1995	4.2	2.8
1995-2000	1.5	1.0

An analysis of this data indicates that population growth in the 20-60 age group comprised 22.3 million persons during the last decade (1971-1981) in the USSR as a whole, comprises 8.7 million during the current decade and will comprise only 5.7 million during the next. This attests to the rapid drop in birth rate in the USSR in general and in most union republics and is confirmed by the size of gross reproduction coefficients (the number of girls given birth to by a woman during her reproductive life).

In 1958-1959 the gross coefficients were: 1.36 in the USSR, 1.27 in the RSFSR and 2.43 in the Azerbaijan SSR; in 1969-1970 they comprised 1.18, 0.97 and 2.27 respectively; and in 1978-1979--1.11, 0.93 and 1.70. During this period the gross coefficient dropped by 18.4 percent in the USSR, by 26.8 percent in the RSFSR and by 30.1 percent in the Azerbaijan SSR.

This data attests to the following:

--first, to the decreased birth rate in the country as a whole as well as in the two aforementioned republics;

--second, to the fact that when viewed in percentages the drop in gross reproductive coefficient occurred significantly more rapidly in the Azerbaijan SSR than in the RSFSR or in the USSR as a whole;

--third, in the RSFSR the gross reproductive coefficient in 1978-1979 was 0.09 smaller than optimal from the economic point of view (the optimal gross reproductive coefficient equals 1.2), in the USSR it approached optimal, and in the Azerbaijan SSR it was somewhat higher despite the drops that have occurred during the last 20 years.

Thus, it will be impossible to use demographic measures to change the situation in the country regarding providing labor supplies for the national economy until the end of the present century. If birth rate should go up at any time soon it will have a positive effect on the labor balance only in the next century.

"Under the conditions existing for the 1980's," said Comrade L. I. Brezhnev at the 26th CPSU Congress, "a careful and economic attitude toward labor resources acquires special significance."⁶ The maintenance of existing labor resources and in particular the maintenance of the work capability of individuals who have

reached retirement age is of great socioeconomic significance, and during the current and subsequent decades their significance will continue to grow. At the 30th Congress of the Azerbaijan CP candidate-member of the Politburo of the CPSU Central Committee and first secretary of the Central Committee of the Azerbaijan CP, Comrade G. A. Aliyev, in emphasizing the importance of this problem, pointed to the necessity "...of a broader redirection of retirees toward socially-useful activities."⁷

The maintenance of work capability in the population is related to the solution of many problems of an economic, technical and social nature. In his keynote speech to the 26th CPSU Congress the General Secretary of the CPSU Central Committee, Comrade L. I. Brezhnev, pointed out, "The 25th Congress named concern for the health of the Soviet people as one of the most important social goals."⁸ For a period of many years following the victories of Great October Soviet public health and medical science developed at a rapid pace--the size of medical cadres increased, the number of medical facilities grew and there were growing allocations from the budget. This was the basis for their great achievements.

Under conditions of a developed socialist society, scientific-technical progress provided a basis for the growth in intensive methods to solve economic and social problems. The sufficiently high level of economic possibilities for public health in the USSR serves as a basis for the transition to intensive development. In connection with this there are very urgent problems regarding improving the level of administration of the public health system, the effectiveness of the training and utilization of cadres within the branch, the constant increase in the number of specialized public health facilities, equipping them with modern medical equipment, the use of computers to develop subsystems to manage public health in diagnosis, dispensary control and the use of the most modern means of diagnosis and treatment. In the country all the necessary requirements have been created for the successful implementation of a preventative approach to public health.

At the present level among the prophylactic measures related to the preservation of labor resources great importance is attributed to public health clinics for the population. The Minister of Health of the USSR, S. P. Burenkoy, pointed to the fact that, "The keynote speech of the CPSU Central Committee to the 26th party congress emphasizes the necessity to improve the effectiveness of public health clinics and to increase the number of persons they service. Our goal is to provide the services of public health clinics to the entire population, and especially to children, adolescents and women and to those groups that are at risk for a particular disease."⁹ Over a period of many years considerable experience has been gathered in the country concerning providing the services of public health clinics to the population.¹⁰ This work is being done in the Azerbaijan SSR as well."

The significance of the effectiveness of measures to provide the services of public health clinics to the population, as established in the "Basic Directions for Economic and Social Development of the USSR in 1981-1985 and in the Period to 1990," is important in dealing with problems related to increasing and preserving labor resources. Clinical services to the childhood population will

have a positive effect on dealing with this problem in the near and distant future; services to the adult population, especially to those at risk for a specific disease will have their effect at the present time as well as in the next few decades.

The transition to providing the services of public health clinics to the entire population depends not only on the availability of cadres and a material-technical base for public health but also on their condition--on the level of specialization of medical cadres, on the availability of diagnostic equipment, on the use of computers and other resources to make the physician's job easier and more intensive. At the current level this limits, to a certain degree, the number of measures that can be implemented within the entire system of public health. In our opinion, the necessary possibilities for providing the services of public health clinics exist in closed medical-sanitation sections serving the workers of industrial enterprises. The implementation of clinical services to the entire population will have a positive effect on decreasing illness and temporary disability to work and will thereby preserve labor resources.

In providing general services in public health clinics it is important to prophylactically examine the population, which is being done more and more. As a result of this it will be possible to identify more people who are at risk for a particular disease. With ongoing treatment in public health clinics there will then be a decrease in the number of persons at risk, a decrease in illness in the population and an improvement in the health of the country's labor resources.

In a developed socialist society public health clinics for the entire population are a basic feature of the prophylactic method. The service has become a complex of widely-implemented measures with the active participation of party, soviet and public organizations, organs and public health facilities and directed at dealing with social, economic and sanitation-hygiene measures. Its results will have a positive effect on decreasing illness, disability and death in the population, on increasing longevity and the number of years a person is able to work. It will facilitate the strengthening, preservation and growth of labor resources. This determines the socioeconomic significance of public health clinics for the entire population.

FOOTNOTES

1. "Narodnoye khozyaystvo Azerbaydzhanskoy SSR za 60 let" [The National Economy of Azerbaijan Over a Period of 60 Years], Baku, Azerbgosizdat, 1980, p 35.
2. Ibid., p 237.
3. L. I. Brezhnev, "Materialy 26 s'yezda KPSS" [Materials of the 26th Congress], Moscow, Politizdat, 1981, p 55.
4. Ibid., p 38.

5. V. Perevedentsev, "Narodonaseleniye i demograficheskaya politika partii" [The National Population and the Party's Demographic Policies], POLITICHESKOYE SAMOOBRAZOVANIYE, 1981, No 8, p 45.
6. L. I. Brezhnev, "Materialy..." p 41.
7. G. A. Aliyev, "Otchet Tsentral'nogo Komiteta Kommunisticheskoy Partii Azerbaydzhana 30 S"yezdu Kommunisticheskoy Partii Azerbaydzhana 28 Yanvarya 1981" [Report of the Central Committee of the Azerbaijan Communist Party to the 30th Congress of the Azerbaijan Communist Party on January 28, 1981], BAKINSKIY RABOCHIY, 28 Jan 81.
8. L. I. Brezhnev, "Materialy..." p 61.
9. S. P. Burenkov, "O zadachakh zdravookhraneniya i meditsinskoy nauki v svete resheniy 26 s"yezda KPSS" [On the Goals of Public Health and Medical Science in the Light of the Decisions of the 26th CPSU Congress], SOVETSKOYE ZDRAVOOKHRANENIYE, 1981, No 7, p 3.
10. S. P. Burenkov, "MEDITSINSKAYA GAZETA, 7 Nov 77.
11. "Materialy 26 S"yezda KPSS" [Materials of the 26th Party Congress], Moscow, Politizdat, 1981, p 182.

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8228

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MEDICINE

PREVENTION OF CHRONIC NONINFECTIOUS DISEASES

Riga SOVETSKAYA LITVA in Russian 5 Jan 83 p 2

[Interview of first deputy minister of health of Lithuanian SSR M. Zaicauscas by SOVETSKAYA LITVA correspondent]

[Text] [Question] An integrated program of prevention of chronic noninfectious diseases is now being introduced in the republic. What induced physicians to develop it?

[Answer] As is known, the diseases determined to a significant degree by civilization and by intensive development of science and technology emerged vigorously and dynamically to the forefront during our century. Among them are cardiovascular, oncological and diabetes diseases and diseases of the support and motor apparatus. According to the statistics in many developed countries, more than 60 percent of the death rate is caused by them. There is at present no need to analyze the reasons for this seemingly paradoxical phenomenon: they have long been explained. Their pernicious consequences are just as well known. Physicians have begun to struggle with many diseases.

Then why are there such frightening statistics? Because the onset to chronic noninfectious diseases usually proceeds along the path of treating patients and rehabilitation of them and secondary preventive measures during early diagnosis of the disease are employed in the best case. I am convinced that this is the main cause. Moreover, although an unprecedented level has been achieved in practical medicine, there is still much yet unknown about some diseases--determination of them and about the tactics of treatment. Also many "classical" forms of diseases are now undergoing such changes that timely and precise diagnosis of them is difficult. Enormous attention is being devoted to working out effective methods of diagnosis and treatment--technical and medicinal.

But it is no accident that it is said: it is better and easier to prevent a disease than to treat it. It is in this direction--preventive--that the efforts of Soviet medicine are directed. Prevention has always been and will remain the main principle of our health. Earlier, beginning with childhood, determination of such so-called risk factors that may provoke or accelerate the development of one or another diseases comprises an important part of scientific research and practical work of physicians.

[Question] Speaking about risk factors, do you have in mind the hereditary apparatus, the so-called tendency to some disease inherent in man from birth?

[Answer] Yes, in talking about early study of the patient, beginning with childhood, I had in mind specifically solution of the problems of genetics. But many risk factors occur later and unfortunately are the fault of the carrier himself. These are smoking, abuse of alcohol, sedentary habits, the inability to prevent stressful situations, failure to observe nutritional habits, efficient ordering of the day and so on. It is these vices, and they cannot be called otherwise, that determine to a significant degree the diseases named above. Decisive and universal control of them and effective sanitation and educational work in the given field are part of the preventive measures which have already been implemented over a number of years and improvement of which is provided in the integrated program.

[Question] The task of the program is clear--maximum early diagnosis and prevention of disease. Please tell me in more detail about its main components and methods of implementation. Should this measure be regarded as an experiment or as a long-term directional activity? After all, work is still being conducted in only some rayons.

[Answer] Precisely--in five: Kayshayador, Kretinga, Kupishkis, Ionishkis and Varena and also in Kaunas. But before talking about the essence of the program and its main aspects, I would like to answer the question. The program is experimental, but is calculated for 10 years and perhaps this is both an experiment and a future long-term working plan. As experience is accumulated and data are generalized and the structure and methods are improved, the program will be implemented step by step throughout the entire territory of Lithuania.

A questionnaire, a type of "medical census" of the entire population--has been proposed in the mentioned rayons and Kaunas to determine the possible diseases, risk factors and state of health of the people. A questionnaire insert sheet to the disease history has been worked out by the prevention laboratory created especially at the Kaunas Medical Institute. It includes many questions: diseases incurred, arterial pressure, weight, whether the patient smokes and so on. The social living conditions of people, their work and habits, intake of water of the necessary quality, the environment and so on will be studied at the same time. In short, an extensive analysis is being conducted.

Not only medical workers are being recruited for this. We are incapable of conducting such a varied and extensive survey of the objects of investigations alone, you agree. We are in close contact with Minvuz [Ministry of Higher and Secondary Specialized Education], Minsel'khoz [Ministry of Agriculture], Goskomizdat [State Committee for Publishing Houses, Printing Plants and the Book Trade] and many other ministries and agencies. This will contribute to extensive investigation of various aspects of the program and effective monitoring of its introduction.

Incidentally, I would like to emphasize that implementation of a preventive program envisions not only research work and dispensary system of the

population but also, as follows from its name, prevention. Therefore, both problems of a scientific nature--determination of the most effective organization of the polyclinic service from the medical and economic viewpoint in improvement of diagnosis and specific problems--reduction of the number of smokers, reduction of alcohol use and increasing the physical activity of the population in the investigated regions. But the final goal of the program is to reduce the death rate of the population in the republic.

[Question] Is a similar experiment being conducted anywhere?

[Answer] The given program is being tested simultaneously in a number of other states. Lithuania was selected to study it in our country. But the World Health Organization (WHO), at whose initiative this measure is being implemented, supervises all this work in the European region.

We are proud of the fact that the USSR Ministry of Health has given us the opportunity to conduct such an important international research program. This again indicates the recognition of the success of physicians of Soviet Lithuania--scientists and practitioners in cardiology, rheumatology, neuropathology and endocrinology and in organization of work to determine and prevent chronic noninfectious diseases. And this success was guaranteed by creation of the necessary material and technical base of the therapeutic institutions and by good staffing with personnel.

The concern of the party about the health of the people was clearly manifested in this planned, specific development of health in our republic, as throughout the entire country. As is known, this goal was named the most important social task for the 25th and 26th CPSU Congresses. The specific paths of solving it were determined in the decree "On supplementary measures to improve the health protection of the population," adopted last year by the CPSU Central Committee and by the USSR Council of Ministers. It is important to note in this regard that many aspects of the program which we proposed in the international experiment have been provided for introduction both in the party and government document. Specifically, the task of implementing a complex work program to intensify prevention of diseases and to improve the health of the population during the period up to 1990 was posed in the decree on the title page. All this again convincingly demonstrates that concern about the health of the people is a government matter in a working peoples' state.

6521
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RESULTS AND PROSPECTS FOR STUDIES OF FUNCTIONAL SPECIALIZATION OF CEREBRAL
HEMISPHERES IN MAN

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 10, Oct 82 pp 132-135

KRAUKLIS, A. A.

[Abstract] A summary is presented of a report (in the LaSSR Academy of Science Presidium) studies conducted over the past decade on functional hemispheric laterality in man in the Department of Physiology of the Latvian EKM [expansion unknown] Scientific Research Institute, Latvian SSR Academy of Sciences. These studies were made in conjunction with the psychophysiological research group at the Institute of Philosophy and Law of the Academy. The studies emphasized research on individual characteristics of functional asymmetry and specialization, as well as selective methods for acting on the hemispheres to influence cognitive processes and enhance human creativity. It has been demonstrated that individual subjects can be typed or classified as to the predominance of either the left or right hemisphere in the performance of intellectual tasks, or shown to lack this type of asymmetry. It has also been shown that information overload and stress can diminish or even abolish functional asymmetry and lead to diminished intellectual performance and emotional instability. Such conditions can be rectified by rest over a period of hours or days. Furthermore, the effects of rest can be reinforced and enhanced by selective electrical stimulation of the hemispheres with low frequency current pulses or inductive fields. Future studies on cerebral laterality shall deal with autoregulation and optimization of cognitive and creative functions in processing verbal information, and the use of electric and magnetic fields in biofeedback studies.
[261-12172]

USE OF SORBENT BLOOD IN SURGERY

Leningrad VESTNIK KHIRURGII in Russian No 10, Oct 82 (manuscript received 28 May 82) pp 63-67

BUGLOV, Ye. D. and DOVGAEV, S. I., Belorussian Scientific Research Institute of Blood Transfusion

[Abstract] Clinical findings are presented from the use, in surgery, of sorbent blood, that is, donor blood in which the calcium has been sorbed by cellulose derivatives and acids (particularly phosphoric) used in blood transfusion methods. The main advantage of sorbent blood is that it does not cause cardiac overloads in patients. It has been found that sorbent blood is an effective agent for compensating blood loss during surgery, and it has been used in aorta resections, aortofermoral shunts and lung surgery. Arterial pressure and heart rate remained steady when it was used, and the acid-base balance was undisturbed following large transfusions. Particularly favorable results have been obtained when sorbent blood was used during liver surgery; the lengthier the duration of the surgery the greater the indications for its use. It has also been successfully used in 157 patients (1-2 liters) during gastric surgery for cancer and bleeding ulcers, and in patients undergoing limb surgery. In all cases it was possible to restore and maintain stable hemodynamic indexes. Exchange transfusion has been performed in 113 patients with careful monitoring of the cardiovascular activity; no hemodynamic disorders were observed in any recipient. Sorbent blood transfusions have also been used in artificial circulation (124 operations) during surgery in adults to correct atrial and ventricular trans-septal defects, implant heart valves, eliminate pulmonary artery stenosis and so forth, and in children to correct congenital heart defects. Sorbent blood has been used following massive blood loss during surgery in children (46 patients). No references.

[309-9642]

ORGANIZATION AND MONITORING OF SPECIALIST KNOWLEDGE IN NUCLEAR MEDICINE

Moscow MEDITSINSKAYA RADILOGIYA in Russian No 10, Oct 82 (manuscript received 16 Apr 82) pp 3-10

KASATKIN, Yu. N. and KROTKOV, F. F., Chair of Medical Radiology, Central Institute of Advanced Training of Physicians

[Abstract] Planning and organization of courses in nuclear medicine for medical radiologists are described. Three categories of trainees are provided for: radiologists who spend all their time working in departments and laboratories engaged in radioisotope diagnostics; interns and laboratory technicians

not working in radioisotope laboratories but using particular equipment or methods for specific diagnostic procedures; and, engineering and technical personnel who maintain and service nuclear medicine equipment, including associated computers. The professional knowledge needed by physicians using nuclear medicine methods include: the ability to collect initial information, make decisions about the proposed radionuclide diagnostic procedures, conduct *in vivo* radionuclide studies using radiopharmaceutical drugs, make diagnostic decisions, prepare medical documentation, plan work time, guide the actions of members of the medical team, and deal with questions of medical ethics and deontology; these categories are all fully described. Training courses are organized on a modular basis to facilitate specific learning for individual contingents of professionals. Methodology for assessing the professional skills learned is described. A detailed breakdown is given of the general scheme for carrying out radionuclide studies. The introduction of an objective system for evaluating professional skills has shown itself to be a promising one for improving skills in this area. No references.

[308-9642]

UDC 616-073.916:519.24]:658.386.3

MATHEMATICAL TRAINING FOR NUCLEAR MEDICINE SPECIALISTS

Moscow MEDITSINSKAYA RADIOLOGIYA in Russian No 10, Oct 82 (manuscript received 16 Apr 82) pp 10-12

KASATKIN, Yu. N., SMIRNOV, V. F. and MIKEROVA, T. M., Central Institute of Advanced Training of Physicians, Moscow

[Abstract] Having recognized that physicians practising nuclear medicine should possess a good knowledge of mathematics, and also that shortcomings exist in physician training in this respect, both in the USSR and abroad, the Central Institute of Advanced Training of Physicians has drawn up guidelines for improving knowledge in this area. Specific details are given of the mathematical knowledge needed by physicians in nuclear medicine. In addition to mastering mathematical techniques up to and including the ability to deal with differential equations, the physician must also gain a knowledge of probability theory and mathematical statistics. He must also be able to process study findings, in particular determine the empirical characteristics of random values, evaluate the accuracy of statistical assessments and find confidence intervals; and he must understand the significance of the regression equation and the correlation coefficient. A knowledge of the least-square method must be mastered in order to understand machine processing of dynamic radioisotope studies. This large mass of knowledge can be gained by physicians, given optimum teaching methods, by directing learning toward those areas specifically needed by individuals in the performance of their duties. Practical test use of knowledge gained is essential for retention of mathematical techniques, and mathematical studies should be conducted strictly within the context of nuclear medicine. The increasing use of computers in nuclear medicine will not eliminate but merely alter the need for physicians to improve their mathematical knowledge. No references.

[308-9642]

UDC 618.3-06:616-056.52.612.123-612.648

SOME INDICES OF LIPID METABOLISM AMONG OBESE PREGNANT WOMEN AND THEIR NEWLY-BORN OFFSPRING

Kishinev ZDRAVOKHRANENIYE in Russian No 5, Sep-Oct 82 (manuscript received 18 Nov 81) pp 20-22

LUTSENKO, N. S., Chair of Obstetrics and Gynecology at Zaporozhe Medical Institute

[Abstract] Obesity is one of the most widely spread type of pathology which in recent years has been shown to be on the rise among pregnant women. Obesity puts on additional burden on their organisms and affects the metabolic adaptation of the newborn. Lipid metabolism was studied in 609 obese women and 141 women with normal weight during the course of their pregnancy and delivery. Obesity was shown to lead to fat metabolism disorders in the system "mother-child" as manifested by metabolic disadaptation, affecting various functions of several organs and systems. The changes are much more marked in the newborn and increase their risk of perinatal mortality. The levels of cholesterol, lipids, phospholipids and lipoproteins increased either due to excessive food intake or as a result of their increased synthesis caused by metabolic disorder. Following complications were observed among obese delivering women: late toxicooses, poor delivery activity, untimely loss of fluid, bleeding, increased rate of surgical interventions. The children of obese women also show a series of disorders such as disadaptation syndrome, asphyxia, birth trauma etc. References 6 (Russian).

[278-7813]

UDC 61:62-50

OPTIMIZATION OF PATIENT TREATMENT WITH MAGNETIC APPARATUS

Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 11, Nov 82 (manuscript received 27 Feb 82) pp 86-88

AGZAMKHODZHAYEV, S. M., KADYROV, Kh. K., YANBAYEVA, T. A. and BATIROV, D., Tashkent Order of Labor Red Banner Medical Institute

[Abstract] Mathematical studies were conducted on the correlation between the various parameters of magnetic treatment (number of sessions, exposure time, magnetic field intensity, courses of treatment) and physiological effects (maximum and minimum blood pressure, blood clotting time, plasma prothrombin, recalcification time, etc.). The results showed that increasing the number of sessions leads to an increase in blood pressure, while an increase in the exposure time and field intensity leads to hypotension. The exposure time and the number of sessions had virtually no effect on vascular tone, but higher field intensities improved blood flow. On the basis of these observations a computer program was devised to ensure proper settings on the magnetotherapy equipment for optimum therapeutic effectiveness.

[315-12172]

MICROBIOLOGY

BRIEFS

BACTERIA AGAINST CARCINOGENS--Latvian hydrobiologists have discovered bacteria in the Baltic Sea that render harmless the most dangerous pollutants--carcinogenic hydrocarbons. The director of the Institute of Biology, Latvian SSR Academy of Sciences, G. Andrushaytis comments on the results of the investigations at the request of our correspondent. "Nature has given sea water, like fresh water, the capability of self-cleansing," noted the scientist. "Aerobic bacteria that process all types of organic substances play a special role in this process. But they are not omnivorous: each variety has its own menu. For example, an entire community of invisible sanitation engineers participates in biological breakdown of oil components. We were interested whether there were "lovers" of benzopyrene and its compounds--carcinogenic hydrocarbons--among them. Marine hydrobiologists have not been involved until now in such research. It turned out that these bacteria actually exist in the samples taken in the Baltic. Our collection already numbers more than 30 strains. The collected microorganisms envelop, oxidize and transform especially toxic substances in production wastes and products of incomplete combustion of fuel that settle from the atmosphere. The devourers of carcinogens inhabit the surface of the sea itself. As was determined, their activity increases as a direct function of the number of pollutants. In some cases the concentration of benzopyrene derivatives in water can be reduced by half in one week. We ascertained that these compounds lose their toxic properties due to the effect of the bacteria. Investigations were conducted during an expedition and also at stationary laboratories of our institute and of the Oncological Scientific Center, USSR Academy of Medical Sciences. The Baltic, which washes the shores of seven countries, especially needs decontamination as a closed basin. Therefore, it is of course impossible to weaken the struggle for purification of the sea and to rely only on its forces. [Text] [Riga SOVETSKAYA LATVIYA in Russian 27 Jan 83 p 2] 6521

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MILITARY MEDICINE

UDC 613.68:613.644

NEW NOISE STANDARDS FOR MARINE SHIPS

Moscow GIGIYENA TRUDA I PROFESSIONAL'NNYE ZABOLEVANIYA in Russian No 12, Dec 82 (manuscript received 1982) pp 40-42

[Article by I. I. Varenikov, S. S. Markaryan, O. K. Kubyak, Yu. A. Korotkov, N. A. Strunilin, Moscow, Institute of Hygiene for Water Transport: "New Noise Standards for Marine Ships"]

[Text] The cumulative effect of noise--industrial and non-industrial--aggravates its unfavorable consequences (A. M. Bolkov, 1977; I. L. Karagodina, 1979; A. P. Shitskova, 1981). The necessity to improve noise standards is based on frequent increases in noise levels with the growth of energy supplies of production-transportation structures and with an increase in neural and emotional stress during work, which is an aggravating factor in noise pathology (G. A. Suvorov and coauthors, 1981). The problem of limiting noise is especially urgent for the watch-pattern of work.

In the course of 5 years we studied the acoustical conditions of labor and inter-watch rest for crews of marine ships, as well as the immediate and later consequences of noise. A total of 1,750 persons were studied--950 on ships frequently, at the beginning, end and during trips (before the watch, during, at the end and after the watch), and 800 persons during periodic medical physicals. There was also an analysis of 3,000 outpatient charts of sailors and there were surveys of crews to determine the subjective evaluation of noise and vibration on ships with a simultaneous measure of their levels. Using the ergonomic indicators presented in "Methodological Recommendations on the Development of Differentiated Noise Standards with a Consideration of the Intensity and Difficulty of Labor" 2411-81 No 1958-78, the nature of work of ship specialists was determined.

As a result of the hygienic evaluation of noise on 46 ships and of noise chronometry it was determined that under conditions of long runs with short layovers in ports protection from unfavorable consequences is not fully realized and is realized at a different rate than in regular industry. According to measurements using Bryul' and K"yer equipment, broad-spectrum noise with a maximum of noise energy in the area of a frequency of 63-500 hertz in different-purpose facilities fluctuated within the limits of 55-110 decibels, surpassing (by up to 20 decibels) the tolerated level in the range of a frequency of 500-4,000 hertz in some places of work (machine department, steering, navigation and radio office).

A determination of equivalent levels and doses of noise according to measurements and noise chronometry in GOST 20445-75, 23337-78, 12.1.020-79 and to the methodology worked out by the NII [Scientific research institute] of Industrial Hygiene and Occupational Diseases of the USSR AMN [Academy of Medical Sciences] (E. I. Denisov, 1979) showed that workers in the ship machine service are subject to noise levels during watch that are equivalent to 86-98 decibels. These individuals in "noisy" jobs were put into group one for our research. The representatives of other ship jobs (group two) work under less noisy conditions (64-79 decibels). The doses of noise are smaller for this latter group, whereas for group one they are 7-10 times greater than permitted by GOST 12.1.003-76. With a cabin noise level of 55-65 decibels, during sleep the noise is 30-40 times greater than allowed (SN and P11-12-77) and, as we noted, (I. I. Varenkov and E. I. Denisov, 1981) results in cumulative functional disturbances during a long trip.

The consequences of noise can be coordinated with general broad-spectrum ship vibrations with a level of vibration speed of up to 100-110 decibels at a frequency of 2-63 hertz.

In confirming the energy theory of interaction between noise and vibrations (I. K. Razumov, 1975; G. A. Suvorov and others, 1975, 1980) we noted an increase in specific and non-specific noise disturbances as a result of the combined action of these factors when investigating various ships with differing vibration levels. With the surpassing of sanitation standards for vibration No 1103-73 in some octaves at 4-10 decibels under noise conditions of 91-92 and 72-75 decibels (to study groups one and two respectively), at the end of the watch we noted an increase in functional hearing disturbances by a factor of 1.6-3.6, or by 60-260 percent. A prognosis (B. S. Bessmertnyy, 1967) for an increased frequency of permanent hearing disturbances can reach 6.5 percent.

In addition to the hygienic significance of noise under real ship conditions the data received on long trips attests to the fact that (S. S. Markaryan and coauthors, 1981) obtaining normal acoustical conditions for rest between watches is one of the forms of protection against noise. A direct correlation has been developed between the level and exposure to noise and functional alterations in hearing, TsNS [CNS, Central nervous system] the number of complaints and negative reactions according to the data of subjective assessments of noise. An increase in cabin noise from 40 to 68 decibels disturbed the sleep of 76 percent of sailors. Comprehensive research has shown that for the personnel of marine ships who are healthy and under 50 (Yu. M. Sten'ko and coauthors, 1978) noise in the rest period prior to watch should not exceed 45 decibels.

A study of the long-term consequences of noise has revealed a correlation between hearing loss and additive doses of noise over the period of time one works at the job. With a noise level of 75 decibels no more than 3.5 percent of those surveyed at the age of 30.6 ± 0.7 years of age suffered from cochlear neuritis, but with a level of 95 decibels the percentage increased to 19.5 percent (age 35.9 ± 0.4 years). A similar known correlation between "dose-effect", reflected in the ISO 1999 [Further expansion unknown] international standard, points to an increase in the amount of hearing loss the longer an

individual remains on the job ($r=0.69$; P less than 0.01), as well as to an increase in the frequency of cochlear neuritis according to age-related cumulative noise load ($r=0.53$; P less than 0.05). A hearing loss of various degrees, evaluated according to the classification of V. Ye. Ostapovich and coauthors (1981), was found in one-third of those surveyed. According to indicators for pulse and arterial pressure [AD] the greatest divergence from the boundaries of physiological norms was found in the representatives of "noisy" jobs. The mechanisms for the regulation of the cardiovascular system, according to data from interval cardiography, was found to be extremely stressed in many sailors, and in a number of cases this was accompanied by changes in the regulation of heart rhythm and vessel tone (D. I. Lazarenko and coauthors, 1982). We have also established a more unfavorable and more pronounced noise-vibration effect on those members of "noisy" jobs with an unstable vestibular apparatus (S. S. Markaryan and Yu. A. Korotkov, 1981).

The results that were obtained, which are analogous to individual studies on the distribution of noise pathology among sailors (Krynicki, 1978; Tosev, 1978), confirm the necessity for improving prevention. They were the scientific basis for the elaboration of sanitation laws on noise on marine ships No 2498-81 (SN No 2498-81), which were confirmed by the USSR Public Health Ministry after their successful approval and the approval of two problem committees of national significance--"Scientific Bases for Industrial Hygiene and Occupational Disease," and "Scientific Bases of Hygiene in the Environment." The standards that were worked out establish tolerable noise levels at work and during rest periods between watches on ships, as well as in rest areas and facilities used by passengers of ships.

Depending on the nature of the job and the duration of time that crews are exposed to it on ships, tolerable noise levels are indicated by nine limiting spectra, which differentiates the new standards from the sanitation standard No 416-52 previously in effect. In accordance with GOST 12.1.003-76 a noise level of 85 decibels is permissible at jobs with energy departments and mechanical shops, but there is mandatory use of means of individual protection corresponding to GOST 12.4.051-78. In sound-isolation central administrative posts (TsPU) with telephone and speech communication a noise level of no more than 65 decibels is allowed, which does not contradict the requirements of GOST 12.1.003-76 and which corresponds to modern differentiated standards for the noise factor according to the nature of job activities. We have established that according to the criteria of methodological recommendations on differential standards for noise No 1958-78, the jobs of mechanics, electromechanics, navigators and radio operators belong to categories III-IV according to stress and to categories I-II according to difficulty; the jobs of motor operators, machinists and sailors belong to categories I-II according to stress and to category II according to difficulty. Because of the level of job intensity in navigation, steering and radio rooms noise levels may not exceed 55 decibels. The noise level should not exceed 70 decibels on jobs in holds and on open decks, based on the difficulty and specificity of work that requires increased attention and that is related to the necessity of receiving and sending sound signals under conditions of constant potential for trauma.

While agreeing with standards for tolerable noise levels according to the difficulty and intensity of work for ship specialists presented by G. A. Suvorov and coauthors (1981), SN No 2498-81 also regulates noise levels in facilities that are used for resting between watches--public (55-65 decibels) and in cabins (45 decibels).

The advantage in principle of SN 2498-81 as compared with the "Code on Noise Levels in Ships," which was accepted in 1981 by the Intergovernment Consultation Organization on Marine Shipping (IMCO), is that the former is based on the concept of the effect of noise on the organism as a whole. In contrast to the IMCO Code, which considers the technical "practicability" in limiting noise and the harmful effects on the sense of hearing, it is based on comprehensive physiological and hygienic research on the interrelationship between dose and effect and on an evaluation of the cumulative effects of noise (industrial and non-industrial) as well as on the nature of the jobs being performed by ship specialists.

The standards we have developed are being applied for all marine ships, both those that are operating and those that are being planned, and will work to improve working conditions and prevent the development of noise pathology.

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8228

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PHARMACOLOGY AND TOXICOLOGY

UDC 591.145:591.181:595.772

EFFECT OF SOME ARTHROPOD VENOMS ON COCKROACH (*PERUPLANETA AMERICANA L.*) NEURONS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 265, No 4, Aug 82
(manuscript received 11 Mar 82) pp 1002-1005

MAMATKADIROV, A., ZHUKOV, V. V., USMANOV, P. B. and MANDEL'SHTAM, Yu. Ye.,
Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov,
USSR Academy of Sciences, Leningrad; Institute of Biochemistry UzSSR Academy
of Sciences, Tashkent

[Abstract] The title study was carried out to determine the effects of venoms from *Scolopendra cingulata* and the spiders *Eresus niger* and *Lycosa singoriensis* on the potential at the sixth abdominal ganglion and on the postsynaptic potential. The effects of all the studied venoms are due to a depolarization of the ganglion and a blocking of the synaptic transfer. *S. cingulata* venom elicits the strongest response, the depolarization reaching 15-20 mV and requiring about 30 minutes to return to near normal. Studies on isolated nerves confirm previous indications that the specific effect of the toxins is to disrupt the transfer of nerve impulses in the cholinesterase synap of the central nervous system. Figure 1; references 15: 3 Russian, 12 Western.
[78-12027]

UDC 615.212.7:547.914].015.4:612.843.7

EFFECT OF Δ 9-TETRAHYDROCannabinol ON DIFFERENTIATION OF VISUAL STIMULI BY CATS

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 45, No 5, Sep-Oct 82
(manuscript received 19 Nov 81) pp 8-11

MACHULA, A. I. and BARKOV, N. K., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy

[Abstract] The effect of Δ 9-tetrahydrocannabinol (Δ 9THC) on differentiation of structuralized visual stimuli by cats was studied along with other parameters of condition-defense reflex. Minimal dose (1.5 mg/kg) of Δ 9THC diminished differentiation of stimuli lasting 300-2000 ms. A 3 mg/kg dose made differentiation impossible even at 1000 ms exposure. Longer exposures showed diminished

differentiation. An assumption was made that at low doses Δ 9THC impairs the reception of visual signals without affecting other differentiation mechanisms, while at higher doses it does impair them too. In addition to the effect on differentiation of visual stimuli, Δ 9THC administration led to a change in the number of interstimuli reactions and latent period of condition reaction to differentiation stimuli. It appeared that Δ 9THC affects the period of decision making. Figure 1; references 20: 6 Russian, 14 Western.
[267-7813]

UDC 615.214.31.07

FURTHER INVESTIGATION AND COMPARATIVE CHARACTERISTICS OF POTENTIAL STIMULATORS OF HIGHER NERVOUS ACTIVITY

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 45, No 5, Sep-Oct 82
(manuscript received 26 Feb 81) pp 108-111

VINOGRADOV, V. M. and GRECHKO, A. T., Chair of Pharmacology (Director - prof. V. M. VINOGRADOV) Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] In continuation of complex investigations of neurotropic properties the following compounds were tested on randomly-bred white rats: gutimine (50 mg/kg), one of its analogues AG-145 (20 mg/kg), peracetam (50 mg/kg), tonibral (20 mg/kg), mefexamide (10 mg/kg) and compared to sydnocarb (5 mg/kg), pyroxan (5 mg/kg) and ethimizole (2.5 mg/kg). Three aspects were investigated: effect of these preparations on consolidation of conditioned reflex of active avoidance (CRAA) and formation of a system of reflex reproduction formation of CRAA in gradual learning process; and effect of these preparations on special retraining of animals. It was established that AG-145, pyracetam and mefexamide had the greatest effect on early stages of the process, while ethimizole, gutimine and pyroxan exhibited them in late stages. This acceleration of the formation of condition reflex is evidently connected with activation of the information transfer to long term storage, formation of reflex reproduction system, decrease of fear and stabilization of emotional status. References 7: 6 Russian, 1 Western.

[267-7813]

UDC 616.89-092.9-02;615.214.31.032.81

SOME ASPECTS OF DEVELOPMENT OF A PSYCHOSIS MODEL IN RATS EXPOSED TO INTRACEREBRAL ADMINISTRATION OF LYSERGIC ACID DIETHYLAMIDE

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 45, No 5, Sep-Oct 82
(manuscript received 15 Feb 81) pp 16-19

KRENDAL', F. P. and KUDRIN, A. N., Chair of Pharmacology (Director - prof. A. N. KUDRIN) at the Pharmaceutical Department of I Moscow Medical Institute imeni I. M. Sechenov

[Abstract] The work was carried out in 1970-73 and reported in form of a PhD thesis in 1974. The study was done on white rats by observing their spontaneous behavior, mobility and emotional reaction (fear and aggressiveness) resulting from intraperitoneal, intravenous and intracerebral (lateral brain ventricles and mesencephalic reticular formation) administration of lysergic acid diethylamide (LDA). The action of LDA was found to be biphasic: increased locomotion in the first phase and total adynamia in the second. The duration and degree of each phase was dose related. Maximum activation was observed at a 400 µg/kg dose of LDA on intraperitoneal administration. Intracerebral exposure to 2-5 µg/kg doses of LDA led to the same effects. The LDA effect on CNS must be due to a trigger mechanism. Figure 1; references 10: 5 Russian, 5 Western.

[267-7813]

PUBLIC HEALTH

UDC 613.6:008

DECREASING INCIDENCE OF OCCUPATIONAL DISEASE

Moscow GIGIYENA TRUDA I PROFESSIONAL'NNYE ZABOLEVANIYA in Russian No 12, Dec 82
pp 2-7

[Article by N. F. Izmerov, A. I. Korbakova, Moscow, Institute of Labor Hygiene and Occupational Diseases of the USSR Academy of Medical Sciences: "Successes in Improving Work Conditions and in Decreasing Occupational Diseases"]

[Excerpts] A new stage in the development of scientific research in the areas of labor hygiene and occupational diseases is related to the decisions of the 25th and 26th CPSU congresses. In establishing specific goals for economic development in 1976-1980, the 25th CPSU Congress elevated the questions concerning improving work conditions and the struggle against occupational diseases to the level of the most important state goals. This required extensive scientific-organizational work by a committee and head institute regarding a change in planning, the coordination of research and the acceleration of the introduction into practice of results of scientific research.

Improved planning and the focusing of efforts and resources on the most urgent and important directions for the national economy facilitated the introduction of the programmed-special purpose method of planning. A comprehensive program was developed for 1979-1990, "Elaboration of the Bases for the Etiology, Pathogenesis, Methods of Diagnosis, Treatment and Prevention of the Most Common Occupational Diseases." The program was put together with a view to the structure of occupational diseases and the development of the national economy in the country. It is directed at preventing the unfavorable effects of dust, noise, vibrations and chemicals on man.

The general aim of the program is the elaboration of the medical aspects for decreasing occupational diseases. Participating in the elaboration of the program are 121 organizations of various types (medical, technical, planning institutes, medical-sanitation sections, sanitation-epidemiology stations and others).

Research is continuing on urgent problems. In 1980 a program was elaborated, "The Study of Cardiovascular Disease as Affected by Occupational Factors," which is part of the state program against arterial hypertension and ischemic heart disease. Programs are being worked out directed at preventing

Table 1
 Growth in the Number of Institutions and Scientific
 Workers Working on the Problem, "Scientific
 Bases for Industrial Hygiene and Occupational Diseases"

Indicator	Year			
	1940	1950	1970	1981
Number of institutions	28	39	94	121
Number of scientific workers	523	581	1,704	2,174
Including:				
doctors of science	43	41	123	184
candidates of science	135	226	753	1,100

occupational diseases in the oil and gas industries, in the radioelectronics industry and in others.

The implementation of research by hygiene institutes and institutions jointly with technological and planning institutes encouraged the elimination of duplication, and insignificant topics. It has enabled us to complete and generalize the results of research in a short period of time, to develop normative-methodological documents for a whole branch of industry and to accelerate their introduction into practice. This affected the number of topics in the composite plan. As we see from Table 2, despite the increase in the number of scientific institutions working on a problem, the number of subjects decreased. The volume of research and its theoretical and methodological level improved noticeably.

Thanks to the development of a powerful scientific base and to the organization of a state sanitation and technical service capable of securing the introduction into practice of the results of hygienic science, during the 60 years of the existence of the sanitation organization in our country great success was achieved in improving work conditions and preventing occupational diseases. The basis for this was a system of theoretical and methodological resolutions concerning health protection of workers and especially the theory of hygienic norms. The basic resolutions in this area were initiated by the scientists of socialist countries, which enabled us to work out and unify a number of normative and methodological documents within the framework of CEMA [Council of Mutual Economic Aid].

The elaboration of theoretical and methodological aspects of the problem has had a considerable effect on the further improvement not only of hygienic norms but also of other prophylactic recommendations. Norms and normative-methodological documents dealing with many aspects of the work environment have been provided with scientific rationales and have been reexamined and improved; sanitation rules for the most important branches of the national economy have been established. In the last 10 years alone about 1,500 norms and normative-methodological documents dealing with this problem have been developed. (Table 3).

Table 2
Characteristics of Joint Thematic Plans According to Problem

Indicator	Year			
	1956	1963	1972	1981
Number of themes on the subject	536	1,105	1,197	572
Number of institutions working on a problem	34	90	94	121
Number of works on the following subjects:				
Labor hygiene in industry using chemicals (hygiene, toxicology, clinic)	151	420	504	183
Labor hygiene and occupational diseases in industry involved in dust production	106	250	176	60
Labor hygiene and occupational diseases in individual branches of industry	74	192	223	121
Physical factors in the production environment	78	191	192	102
Physiology of labor processes	9	39	77	60
Hygiene in agricultural labor	50	93	61	36

It should be noted that during the last decade extensive work has been done to build a foundation and to confirm the GOST system of industrial safety, which is the highest legal form for introducing hygienic requirements and recommendations into practice. The hygienic standards, recommendations and requirements included in GOST enable us to exclude the intrusion of unfavorable factors in the industrial environment with regard to the design of machines and equipment, the elaboration of technological processes and the construction of industrial enterprises. It is important to point out that during the last five-year plan 32 state standards were standardized for the CEMA member nations. This attests to the high quality of Soviet standards, their great practical significance and widespread acknowledgement.

Through the joint efforts of scientists, public health workers and trade unions extensive work has been done to improve work conditions for industrial workers. This resulted in better health for them and a decrease in the level of unfavorable factors in the industrial environment. According to data from the Moscow City Sanitation and Epidemiology Station, in 70 percent of work places the industrial environment corresponds to standards or is much better than the levels the standards allow. As a result of the improvement in work conditions the level of occupational disease is decreasing from year to year (by 24 percent in the ninth and 26 percent in the 10th five-year plans), there are practically no cases of acute intoxication in the chemical industry and chronic poisoning is characterized by a mild course with unspecific symptoms.

Table 3
Normative-Methodological Documents Confirmed According to
the Problem, "Scientific Bases for Industrial Hygiene and
Occupational Diseases," for 1970-1980

Documents	Five-year Plan	
	Ninth	Tenth
SBT Standards [System of defectless labor]	25	28
CEMA Standards	--	32
Sanitation regulations	58	34
PDK [Maximum permissible concentration]	223	283
OBUV [Further expansion unknown]	--	125
Methodological regulations and recommendations	269	391
Total	575	893

Table 4
Growth in the Public Health Network
in Industrial Enterprises (absolute)

Institution	Year			
	1965	1970	1975	1980
Medical-sanitation sections	1,196	1,145	1,353	1,376
Hospitals (fixed)	960	1,058	933	929
Total number of beds in them	147,327	186,567	202,875	232,064
Average capacity	153	176	217	217
Health points:				
Physician	23,632	28,994	31,761	35,323
Feldsher	5,425	3,268	2,529	2,099

Improvements in work conditions and a decreased incidence in occupational diseases was also facilitated by a series of measures to improve medical-sanitation services for industrial and agricultural workers.

During the last decade an occupational disease service was established in the country. Occupational disease specialists provide professional treatments and consultations to public health organs and workers on the basis of republic, kray, oblast and city hospitals.

There has been a reorganization of the network of public health facilities in industrial enterprises. Medical-sanitation stations have been enlarged and the total number of beds in them has increased (Table 4).

Within the system of treatment-prophylactic services to the workers of industrial enterprises, of health maintenance and of decreasing general and industrial

Table 5

Development of a Network of Sanatoriums and
Preventative Medicine Facilities

Indicator	Year						
	1950	1955	1960	1965	1969	1975	1980
Number of sanitation and preventative medicine facilities	373	469	833	1,177	1,501	1,989	2,491
Number of places in them		11,145	15,805	33,601	61,183	91,162	150,800
Average capacity	30	34	42	52	61	76	83.5

illness a significant role is played by sanatorium-preventative medicine facilities, which are an important link in treating the ill who need regular services by a public health clinic, the contingent of chronically ill or long-term ill as well as workers and employees who are on jobs with difficult and harmful work conditions. During the last 10 years the network of sanatoriums-preventative medicine facilities increased by more than fivefold (Table 5).

Thus, whereas during the first years of Soviet power discussion centered on the development of safe working conditions, now industrial hygienists have set as their goal the study of low intensity industrial factors, foundations for measures to improve industrial work conditions, prophylactic services and in the future--the complete elimination of occupational disease, the elaboration of factors in the industrial process that have a positive effect on health and work capability, and the elaboration of standards that will secure safe and comfortable work conditions.

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8228
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INDUSTRIAL HEALTH INSPECTION IN THE RSFSR

Moscow GIGIYENA TRUDA I PROFESSIONAL'NNYE ZABOLEVANIYA in Russian No 12,
Dec 82 pp 7-10

[Article by K. I. Akulov, I. V. Gerasimova, Moscow: "Industrial-Sanitation Inspection in the RSFSR"]

[Text] This year the Soviet people will mark a noteworthy event--the 60th anniversary of the formation of the USSR.

In implementing the plans indicated by the communist party and Soviet government, the country's workers have achieved great victory in improving the economy, in developing science, technology and culture, in transforming all aspects of public life and in improving the well-being of the people.

Nowhere and never before has so much emphasis been placed on solving questions related to protecting the health of the population as here in our country, with its attitude of equality toward all nationalities and peoples.

Already during the early stages in the development of the first socialist country in the world the organization of a single state system of medical-sanitation services for the population was presented as a main problem. The main goals of Soviet public health were clearly formulated at the 8th Congress of the VKP(b) [All-Union Communist Party of Bolsheviks] in 1919 in a program which emphasized preventative medicine.

A milestone in the development of Soviet public health was the passage of the decree, "On the Sanitation Organs in the Republic," by the Council of People's Commissars of the RSFSR on 15 September 1922.

In March 1930 in a speech at the 7th All-Russian Congress of Public Health Departments the people's commissar of the RSFSR, M. V. Vladimirovskiy, said, "During the epoch of socialist restructuring of all of the foundations of life the goals of public health, its program of health measures are expanding to the level of goals for general social well-being. Sanitation physicians, occupational disease physicians are becoming the organizers and practical instructors on measures that are essential for health in the entire region..."¹

¹M. V. Vladimirovskiy, "Voprosy sovetskogo zdravookhraneniya" [Questions of Soviet Public Health], Moscow, 1960, p 48.

The successful solution to these problems was secured by the organization of sanitation-epidemiological stations in accordance with a resolution confirmed by USSR Narkomzdrav [People's Commissariat of Public Health] on 14 May 1939.

It is also especially important to note that only in our country are sanitation-hygiene measures, directed at improving work conditions and preventing disease, legally established as the duty of all state organs, enterprises, institutions and organizations.

The structure as well as the scale and volume of work in industrial-sanitation controls has changed over the years during which Soviet power was being established. Its goals, functions and implementation were determined in accordance with the development of the national economy and were made more precise in the government's subsequent resolutions.

Whereas previously sanitation controls in the area of industrial hygiene were limited to the requirements for industrial facilities, long-term practical experience has shown that the main factors affecting industrial work conditions were the conditions of technological processes and equipment. It is they that determine the formation of various harmful or unfavorable factors in the industrial environment and the nature, difficulty and danger of industrial processes. All of this naturally made sanitation controls, both preliminary and ongoing, more difficult.

In order to move to a qualitatively new level of industrial-sanitation controls the RSFSR Ministry of Health took measures to strengthen the material-technical base of sanitation-and-epidemiological stations and to equip them with cadres and modern laboratory equipment and apparatuses. In 1980 sanitation-epidemiological services were offered to the public by 2,467 sanitation-epidemiological stations in administrative territories and 95 stations located on water transport.

At the present time in all centers of autonomous republics, krays and oblasts large, well-equipped facilities were created, such as the sanitation-epidemiological stations of Buryatia, Komi and Udmurt ASSR's, Gor'kiy, Irkutsk, Kuybyshev, Leningrad and Tula oblasts, Krasnoyarsk Kray, Maritime Kray and many others.

Sanitation-and-epidemiological stations are equipped with engineers who participate in controlling on a precautionary as well as ongoing level.

Significant work has been completed to organize specialized laboratories. In addition to laboratories of sanitation-hygiene departments (445), 69 sanitation-epidemiological stations have organized toxicological laboratories, 75--laboratories for physical-chemical research, 98--laboratories for determining residue of poisonous chemicals, 11--laboratories for controlling the electromagnetic field. In some large sanitation-epidemiological stations of the RSFSR there are laboratories for the physiology of labor, which enables workers to implement sanitation controls with the use of physiological methods.

Over 3,000 departmental sanitation-hygiene laboratories, operating under the methodological management of territorial sanitation-epidemiological stations, have been created to constantly control adherence to sanitation and hygiene standards in industrial enterprises.

The discovery and elimination of existing violations by constantly and persistently improving work conditions at all stages of technical progress in industry became possible only through the combined efforts of public health organs, economic and trade union organizations and scientific-research hygienic and medical institutes. With this aim the RSFSR Health Ministry and the central committees of branch trade unions in 1968 began studying questions of work safety, sanitation-communal services and preventing occupational diseases in workers.

This type of approach enables us to study individual departments in detail, to understand the situation within a branch and to focus the attention of economic and trade union organizations and medical workers on a comprehensive approach to basic and fundamental questions such as curtailing heavy and unskilled labor, introducing progressive technology and industrial esthetics, improving sanitation-hygiene circumstances in production with a consideration of the specific features of that branch, improving the quality of medical services to workers, and objectively evaluating the effectiveness of health measures that are being elaborated and introduced.

Usually the results of studies are discussed at joint meetings of the board of the public health ministry and the presidium of the central committees of branch trade unions with reports by the involved branch administrators after a preliminary examination. During the 9th and 10th five-year plans the RSFSR Health Ministry and the branch central committee of trade unions studied the status of medical-sanitation services for workers in 40 branches of industry--cement, coal, light, textile, ferrous and non-ferrous metallurgy, tire, cellulose-paper, machine tool, electrotechnical, building, and so forth.

Long-term work with interested organizations, departments, central committees of branch trade unions, scientific-research technical, planning and hygienic institutes enabled us to achieve certain results--the introduction of a complex of health measures in the enterprises of a number of branch ministries.

In particular, the ministry of the automobile industry has replaced lead with synthetic pastes in the process of straightening truck bodies in auto plants. This eliminated lead poisoning in individuals working here.

Improvements in welding operations in Chelyabinsk, Gorkiy and other oblasts prevented manganese poisoning and foundry fever among building and installation workers. As a result of the introduction of comprehensive health measures in 1980 as compared to 1986 the number of work days missed by such workers decreased by 6 percent.

Medical-engineering brigades are a new progressive form of participation by industrial-sanitation doctors in creating healthy and safe working conditions in enterprises and in increasing labor productivity in the national economy.

In generalizing this experience in the plants of Chelyabinsk, Sverdlovsk, Gorkiy, Tula, Krasnodar, Orenburg and other cities, we must mention that the quality and content of health measures elaborated on the basis of the cooperation of doctors and engineers has improved significantly. They are acquiring the character of scientific decisions and consider the specific possibilities of the entire enterprise as well as of individual shops. The work of medical-engineering brigades has enabled us to increase the effectiveness of medical exams and to decrease the time needed by medical personnel to complete the exams.

In creating safe conditions in industry special importance is placed on the study and introduction of work experience of industrial hygiene departments in sanitation-epidemiological stations. For example, the board of the RSFSR Health Ministry and the Central Committee of the automobile workers' trade union approved and introduced the work experience of public health organs, the administration and the trade union organization regarding industrial esthetics and production quality at the Gorkiy Automobile Plant; the board and the central committee of the trade union for workers of the chemical and petrochemical industries--at the Shchekinskiy Chemical Combine of Tula Oblast.

The work experience of the industrial hygiene department of the Krasnodar City Sanitation-Epidemiological Station regarding improving work conditions and preventing occupational diseases in the city's enterprises has received widespread practical application.

The joint efforts of practical facilities and scientific-research hygiene and medical institutes have a definite significance in the elaboration and use of hygiene recommendations with regard to creating the best possible work conditions. Recommendations and practical conclusions of such research are utilized extensively in preparing the sanitation laws of the USSR, the government's resolutions and other documents pertaining to questions of work safety as well as in elaborating comprehensive plans of sanitation and health measures.

The recommendations of the Gorkiy Scientific-Research Institute of Industrial Hygiene and Occupational Diseases to the enterprises of the Orgsteklo Production Association of the ministry of the chemical industry are widely used not only by the sanitation service but also by chemical-technological institutes in planning new production and in developing improved technological processes in the chemical industry. Of great economic effectiveness was the realization of the health measures of the Sverdlovsk Scientific-Research Institute of Industrial Hygiene and Occupational Diseases and the sanitation-epidemiological stations of Irkutsk and Sverdlovsk oblasts in aluminum electrolysis shops. The research of the Novosibirsk Scientific-Research Sanitation Institute and the sanitation-epidemiological station of Kemerov Oblast played a large role in the prevention of occupational disease in Kuzbass miners. The joint work of public health organs and scientific-research institutes continues to be improved.

The result of purposeful work is the constant decrease in incidence of occupational disease in the republic's enterprises. During the 10th Five-Year Plan it

decreased by 14.6 percent, including a decrease of 12 percent for serious occupational diseases of the pulmonary system, which usually lead to disability, and a decrease of 25.6 percent for vibration diseases.

A steady tendency toward decreases was noted in the enterprises of those ministries and departments that were the subject of investigations at the joint meetings of the board and presidium of the trade union central committee. This refers especially to the ministries of ferrous metallurgy, the chemical and coal industries, of installation and special building operations of the USSR, and others.

While speaking about the successes of industrial-sanitation controls in the RSFSR we must also mention the people who are organizing and implementing this work. Enthusiasts in their work, experienced organizers and qualified specialists work in sanitation-epidemiological stations. Among them are sanitation doctors for industrial hygiene N. A. Dobova (Voronezh Oblast), A. V. Yepishin (Gorkiy Oblast), M. I. Tsigel'nik (Kemerov Oblast), G. A. Leshcheva (Krasnodar), M. G. Yanovskaya (Moscow Oblast), I. S. Tolchinskaya (Saratov Oblast), M. G. Chemaldinov (Sverdlov Oblast), T. N. Novoselova (Perm Oblast) and many others.

The 26th CPSU Congress assigned great and responsible tasks to the organs of the state sanitation control institutions with regard to industrial hygiene. A great deal remains to be done to secure sanitation-epidemiological well-being for the workers of industry, agriculture and the building industry.

The workers of the sanitation-epidemiological service of the RSFSR, realizing the importance of the assigned goals, will make every effort to meet them with honor.

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8228

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60TH ANNIVERSARY OF FORMATION OF USSR AND SUCCESSES IN DEVELOPMENT OF SOVIET PUBLIC HEALTH

Moscow SOVETSKAYA MEDITSINA in Russian No 12, Dec 82 (signed to press 3 Dec 82)
pp 3-10

[Article by S.Ya. Chikin, Moscow]

[Text] The RSFSR, Ukrainian SSR, Belorussian SSR and Transcaucasus SFSR were created during the course of the Great October Socialist Revolution. The USSR was formed on 30 December 1922 at the 1st All-Union Congress of Soviets as a voluntary state union of the Soviet peoples. Later, in 1925, the Uzbek SSR and the Turkmen SSR were included. The prototype for the organization of the USSR was the multinational RSFSR, which, following the Great October Socialist Revolution, in a short period united the many peoples and nationalities living on its territory on the principles of proletarian internationalism. V.I. Lenin saw in the federation of nations a need to switch "...to a closer unity of the workers, who have learned to raise themselves above national differences."* This was a triumph for Lenin's national policy and marked the firm consolidation of all the Soviet peoples and the establishment of diplomatic relations between the USSR and many countries in the West. From 1922 to 1925, diplomatic relations were established with Germany, England, France, Italy and Japan.

The successful completion of the first two five-year plans enabled our country to transform itself from a backward agrarian country into a powerful industrial state with a highly developed kolkhoz, socialist economy. In December 1936 at the 8th Extraordinary Congress of Soviets, the new USSR Constitution was adopted. With its adoption, the Azerbaijan, Armenian and Georgian SSR's became part of the USSR with the rights of independent union republics. The Kazakh and Kirghiz ASSR's became independent union republics; the Tajik SSR had done so even earlier, in 1929. In 1940 the Moldavian, Latvian, Lithuanian and Estonian SSR's were incorporated into the USSR.

The moral-political unity of the country on the basis of the rapid development of production forces and culture transformed the USSR into a mighty power.

* V.I. Lenin. Complete Collected Works, Vol 36, p 73

Thus, the Great October Revolution became a turning point in the life of the oppressed peoples of tsarist Russia. Many of them moved directly from feudalism to socialism. The Soviet authorities took into account the economic and cultural level of each people. The main thing in the development of the former tsarist outlying districts was the close and indissoluble link between the Russian people and all the other peoples and nationalities. V.I. Lenin demanded that tactics with respect to the former national districts of Russia should be altered according to the national features of each of them. To the heavy yoke of tsarism, which tried to hold back the process of consolidation of the nations and slow down economic and cultural development, the party counterposed the policy of unity of the workers and rapprochement of the nations on the principles of proletarian internationalism and equality. This was all in accordance with the ideas of V.I. Lenin. He wrote: "Against the old world of national oppression, national bickering or national isolation the workers set a new world of unity of the workers of all nations, a world in which there is no place for privilege nor for the slightest oppression of man by man."¹ Instead of a policy of one nation trampling another, which was always done in tsarist Russia, an era of friendship of the peoples dawned, of mutual respect and mutual aid. The aspirations of the people, as expressed in the prophetic words of the great Russian poet A.S. Pushkin, were realized; Pushkin considered that for Rus' a time would come when "the peoples, their differences forgotten, will be united in a great family..."

Leninist national policy was aimed at liquidating socioeconomic backwardness, destroying the roots that engendered it, and uniting all nationalities in a single Union of Socialist Socialist Republics.

One significant step in the rapprochement of the peoples in all economic and cultural spheres was made after the transfer of agriculture to the socialist system and completion of the country's industrialization, including the former outlying districts. The collectivization of agriculture raised not only the economic situation of the peasantry but also its cultural level, while industrialization, along with a developed economy, promoted rapid social development in all union and autonomous republics, oblasts and rayons.

Fifty years after the formation of the USSR comrade L.I. Brezhnev, in his report devoted to that jubilee, said that "Our party well understood that in order to overcome all the consequences of national oppression and inequality it was not enough to pass even the best and most just laws. It was necessary to overcome the economic and cultural backwardness of the formerly oppressed nations and nationalities. In other words, it was not enough to abolish legal inequality among nations; it was essential to have an end once and for all to the actual inequality between them. The resolution of this problem became one of the party's main political goals."²

1. V.I. Lenin. Complete Collected Works, Vol 23, p 150.

2. L.I. Brezhnev. "Aktual'nyye voprosy ideologicheskoy raboty KPSS" [Topical Questions of CPSU Ideological Work], Vol 1, Moscow 1978, p 552.

Over the years our country's economy has changed beyond recognition. Over the 60 years the volume of industrial output in the USSR has grown by a factor of 537. The changes that have taken place in the individual republics are even more striking: in the Kirghiz SSR it has grown by a factor of 711, in the Belorussian SSR by a factor of 728, in the Tajik SSR by a factor of 902, in the Kazakh SSR by a factor of 928, and in the Armenian SSR by a factor of 1,036.

In a short time historically the peoples of the former tsarist outlying districts have achieved a high social and cultural level. Whereas before the revolution more than 90 percent of the population of Central Asia and Kazakhstan was illiterate, there are now no illiterate people. Moreover, for every 1,000 people engaged in the national economy, 836 of them in the Kazakh SSR have a higher or secondary education; figures for other republics are: for the Kirghiz SSR 833, the Tajik SSR 801, and the Turkmen SSR 852 (with the average for the USSR standing at 833). This indicates a high level of culture in these republics.

During the 60 years that the socialist republics have been united in a single union, considerable changes have also taken place in public health, particularly in those republics where public health was rudimentary (see table 1 below).

The figures shown in the table testify not only to the rapid and progressive development of public health in all the union republics, but also to the fact that over the 60 years considerable work has been done to bring the main indexes in all the republics closer together. Whereas, for example, at the start of the formation of the USSR the availability of hospital beds in the RSFSR exceeded this index for the Kirghiz SSR by a factor of 1.9, the Uzbek SSR by a factor of 2.7, the Kazakh SSR by a factor of 2.9, the Moldavian SSR by a factor of 3.6, the Turkmen SSR by a factor of 10.9, and the Tajik SSR by a factor of 14.8, in 1980 the situation had radically changed. In terms of availability of hospital beds, the Kazakh SSR has not only reached the level of the RSFSR but even exceeded it. As for the other republics, the great gap in the indexes no longer exists. In 1980, availability of hospital beds in the Kirghiz SSR was only 18 percent less than in the RSFSR; other figures are: 12.7 percent less for the Uzbek SSR, 7.4 percent for the Moldavian SSR, 19.4 percent for the Turkmen SSR, and 23.8 percent for the Tajik SSR.

Changes just as profound have taken place in the training of medical personnel and in providing medical personnel for the republics. Whereas in 1922 the availability of physicians in the Uzbek and Turkmen SSR's was 16.5 times less than in the RSFSR, almost 3 times less in the Kirghiz SSR, and 7 times less in the Kazakh and Tajik SSR's, by 1980 this gap had been significantly closed: in the Tajik SSR, the number of physicians per 10,000 of the population was 43 percent less than in the RSFSR; figures for the other republics were 31 percent less in the Turkmen SSR, 29 percent less in the Uzbek SSR, 28 percent less in the Kirghiz SSR, and 21.2 percent less in the Kazakh SSR. With each passing year these gaps are being closed. With respect to republics such as Georgia, Latvia and Estonia, the number of physicians per 10,000 is even greater than in the RSFSR, while in Lithuania it is the same as for the RSFSR. This shows that the party pursues a constant policy of equality for all citizens, regardless of sex, religion, race and nationality; and this applies equally to public health.

Table 1. Availability of Hospital Beds

Republic	Availability of Hospital Beds per 10,000					Availability of Physicians per 10,000						
	1922	1940	1950	1960	1970	1980	1922	1940	1950	1960	1970	1980
RSFSR	16.3	45.3	59.2	82.2	112.4	129.6	1.4	8.2	15.6	19.3	29.0	40
Ukrainian SSR	12.6	37.7	52.2	79.8	107.6	125.4	2.5	8.4	13.9	18.6	27.6	36.5
Belorussian SSR	7.9	32.6	41.2	68.0	103.8	125.2	1.2	5.7	9.3	14.3	25.8	33.9
Uzbek SSR	6.0	30.1	49.7	84.4	101.8	113.1	0.9	4.7	10.2	13.0	20.1	28.6
Kazakh SSR	5.7	39.5	52.1	79.3	118.2	130.1	0.2	2.7	9.5	12.9	28.8	31.7
Georgian SSR	13.6	36.0	54.6	72.1	91.0	107.1	3.2	13.3	26.7	32.0	36.2	46.7
Azerbaijan SSR	11.0	37.8	57.8	69.1	93.5	96.5	2.6	10.0	22.0	23.7	25.0	33.4
Lithuanian SSR	7.7*	30.0	42.1	77.5	102.2	119.3	1.5*	6.7	10.7	17.1	27.4	40.2
Moldavian SSR	4.5	24.6	45.1	72.3	99.1	120.0	1.6	4.2	10.3	13.6	20.5	31.4
Latvian SSR	24.9*	63.0	71.7	107.3	117.9	136.8	2.6*	13.2	15.1	25.4	35.6	43.9
Kirghiz SSR	8.5	24.1	40.3	73.1	106.3	119.7	0.5	3.8	9.9	14.3	20.7	29.1
Tajik SSR	1.1	28.6	43.9	67.7	97.9	98.8	0.2	4.1	8.4	11.6	15.9	23.4
Armenian SSR	9.9	30.1	47.6	69.6	86.0	83.4	1.7	7.5	18.9	22.2	28.8	35.5
Turkmen SSR	1.5	41.6	61.3	82.9	101.8	104.5	0.9	7.6	13.4	17.3	21.4	27.9
Estonian SSR	26.2*	47.7	66.1	94.1	110.2	124.1	5.6	10.0	13.5	22.8	33.1	41.6

* In 1913

Figures on the training of medical personnel from among the indigenous nationalities of the autonomous republics and okrugs in the RSFSR provide even more graphic proof of this. Whereas before the revolution the overwhelming majority of the peoples and nationalities simply did not have any physicians of the indigenous nationality and only a few of them had two or three physicians, in 1980 in most of the autonomous republics up to 50 percent of the physicians were individuals belonging to the indigenous nationality. In the Bashkir ASSR, 2,349 physicians of Bashkir nationality were working, along with 2,946 of Tatar nationality. In the Buryat ASSR 1,230 of the physicians were of the indigenous nationality. Other figures were: 4,174 in the Dagestan ASSR and 622 physicians of Kabardian nationality and 126 of Balkarian nationality in the Kabardino-Balkar ASSR. In the Karelian ASSR, 71 physicians represented their nationality, in the Kalmyk ASSR 530, in the Komi ASSR 644, in the Mari ASSR 320, in the Mordovian ASSR 620, in the North Ossetian ASSR 1,506, in the Tatar ASSR 3,645, in the Tuva ASSR 242, in the Udmurt ASSR 889, in the Chechen-Ingush ASSR 939, in the Chuvash ASSR 1,354, and in the Yakutsk ASSR 1,174.

In the autonomous oblasts the situation is just as good. In 1980, some 221 of the physicians were of the indigenous nationality in the Adyge Autonomous Oblast, 112 in the Gorno-Altay Autonomous Oblast, 351 in the Karachayevo-Cherkess Autonomous Oblast, and 157 in Khakass Autonomous Oblast.

In recent years physician training for the nationalities of the Far North has also been successful; these are nationalities living both in autonomous okrugs and in the northern regions of a number of oblasts in the RSFSR. For this purpose, special training departments are functioning at the VUZ's in Tyumen', Krasnoyarsk and Khabarovsk. In 1980 some 20 physicians belonging to the indigenous nationalities of the Far North were working in the Taymyr Autonomous Okrug in Krasnoyarsk Kray, and 21 in the Evenki Autonomous Okrug in the same kray. Eleven Nenets were working in the Nenetsk Autonomous Okrug in Arkhangelsk Oblast, 15 in the Koryak Autonomous Okrug in Kamchatka Oblast, 34 in the Chukotsk Autonomous Okrug in Magadan Oblast, 71 in the Khanti-Mansiysk Autonomous Okrug in Tyumen Oblast, and 20 in the Yamalo-Nenetsk Autonomous Okrug [in Tyumen Oblast].

Physicians have been trained not only for the autonomous okrugs but also for the small settlements and nomad camps populated by these nationalities. Thus, in Murmansk Oblast, 4 Saami physicians are working, in Maritime Kray, 4 Nanaians, 3 Udegaians, 1 Itelmen and 1 Orochi, and in Sakhalin Oblast, 3 Evenki and 4 Nivkha, and so forth.

In the CPSU Central Committee decree "On the 60th Anniversary of the Formation of the USSR" it is particularly stressed that "developed socialism graphically demonstrates the indissoluble interconnection between the flowering and rapprochement of all the country's nations and nationalities and the deepening of socialist democracy."

The Kazakh SSR has made a real leap forward in the development of its production forces, culture and public health. The 60th anniversary of the formation of this republic was celebrated in June 1981. The 60-year road it has traversed

has been one leading from a backward, semicolonial outlying district of tsarist Russia to a flourishing socialist republic. From a region of poverty, hunger and epidemic disease, Kazakhstan has become a highly developed industrial-agrarian republic with a high culture. The experience of development in Kazakhstan, as in the other Central Asian and Transcaucasian republics, has shown that within a single generation, in any country formerly finding itself in semicolonial dependence, it is possible to raise it up from poverty, ignorance and almost 100-percent illiteracy to one with a powerful industry, leading agriculture and high culture. Major industrial enterprises are now operating in Kazakhstan. Agriculture has been radically changed.

During the short period in the late Fifties and early Sixties, 26 million hectares of virgin land and long-fallow land were brought into use in the republic, making it one of the granaries of the country. The prerevolutionary backwardness and low level of culture in Kazakhstan (98 percent of the population was illiterate) are a thing of the past. Only 20 years after the establishment of Soviet power, Kazakhstan overcame its illiteracy, and by its 40th anniversary more than 10,000 schools, 28 VUZ's including 4 medical VUZ's, and about 150 secondary specialized training establishments, including 23 medical schools, were operating within the republic.

Successes in the development of public health are most indicative. Before the revolution, there was no public health on the territory of Kazakhstan. In the local districts, annual per capita expenditure on medical services was 14-40 kopecks. Physicians in the small towns had to provide care for a population living on a territory of 60,000 square kilometers, twice the size of Belgium. Each physician had to provide care for 50,000 to 70,000 individuals.

In 1913, on the territory of Kazakhstan, measuring 2,717,000 square kilometers, about one-fourth of the territory of Europe, an area large enough to include France, Germany, England, Italy and others, there were only 196 physicians and 98 hospitals, with an average of 18 beds. As in the other republics, cholera, smallpox and plague epidemics were a common event, and tuberculosis, malaria, trachoma and venereal diseases were widespread. This all led to a high mortality rate, especially among children.

The civil war made the situation with medical care even worse. In 1919 there were only 33 physicians in Kazakhstan. Accordingly, in essence the establishment of Soviet power was a period of creating a foundation for public health on which later a modern system grew up with a material-technical base and large numbers of specialists. The RSFSR People's Commissariat of Health provided much aid for Kazakhstan in developing public health: medical kibitki [mobile premises made up of tents] and mobile epidemiological teams were organized. After the end of the civil war Kazakhstan was given the equipment and furnishings of the military hospitals, with 5,000 beds. A start was made on the creation of polyclinics and dispensaries and expansion of the hospitals. Already by 1925 the Institute of Epidemiology and Microbiology had been organized, and in 1932 institutes of tuberculosis, the eyes, and skin and venereal diseases were set up, along with the Institute of Maternity and Infant Welfare. Later, institutes of physiology, clinical and experimental surgery, regional pathology,

antiplague, labor hygiene and occupational disease, oncology and radiology, and cardiology were established on republic territory. This promoted the appearance in Kazakhstan of a pleiad of medical scientists whose scientific work became available to the whole country. The antishock fluid suggested by academician A.P. Polosukhin was used extensively in medical practice; professor Kh.Zh. Zhumatov and many other scientists contributed weighty ideas about how to deal with infectious diseases.

Enormous work was done by the Kazakh Communist Party Central Committee to organize medical services for the rural workers opening up the virgin lands. In an extremely short time, in these regions more than 300 sector hospitals, about 200 physician's assistants' points and midwifery points, 519 dispensary points and 18 pharmacies were set up. In 1955 alone hospitals with a total of 3,650 beds were built in rural localities. By 1960 about 600 hospitals had been organized in the virgin lands. Only Soviet power could have done this. Nowhere in mankind's history can we find an example of any state building so many hospitals for the rural population in only 5 years. They were quite large hospitals for a rural locality, with an average of 70 beds. The entire country helped in the opening up of the virgin lands. Medical workers came to Kazakhstan from all the republics. In 1960, some 2,240 physicians and more than 13,000 middle-echelon medical personnel were working in the virgin land region, and in the whole of Kazakhstan, 12,000 physicians were working--61 times more than in the prerevolutionary period. Even in those years the availability of physicians in Kazakhstan had outstripped the capitalist countries of England, France, Sweden, Finland, Japan and others, and had approached the average for the country.

In 1979 Kazakhstan had 30.8 physicians per 10,000 of the population, while the average for the USSR was 36.3. Availability of hospital beds was 129.6 per 10,000, while the average index for the USSR was 123.3. This proves that Kazakhstan is an equal republic in the common union of socialist republics, where the level of development in public health is the same as in the RSFSR, the Ukrainian SSR and so forth, and is considerably better than the indexes for the developed capitalist countries.

In Kazakhstan as a whole, striking changes have also taken place. Whereas in 1913 a total of only 244 physicians (primarily in the major cities) and 393 physician's assistants were working on its territory, and there were only 1,800 hospital beds, in 1980 the number of hospitals was greater than 1,700, and there were 2,275 outpatient departments and polyclinics. Some 46,000 physicians and 140,000 middle-echelon medical personnel were working in these establishments. During the years of Soviet power the number of physicians has increased by a factor of 188.5.

The Bashkir ASSR is a striking example of the development of the autonomous republics. Bashkiria became the first autonomous republic in the RSFSR. It had been an outlying district of Russia, with the overwhelming majority of the population illiterate. On its territory there was a total of only 9 schools, each handling 100 students. The training of middle-echelon medical personnel began in Bashkiria in 1908. Before the revolution only 100 people had been trained. The lack of physician training and the only insignificant

training of middle-echelon medical personnel was the reason for the very low availability of physicians. In 1913 the district of Ufa had only 143 physicians, of whom 60 percent were working at the district center. There was an average of 1 physician per 20,000 of the population. There were 342 middle-echelon medical personnel in the district territory, with one medical workers per 9,000. In the regions where the indigenous population lived there were no hospitals and no medical personnel at all.

Improvements in public health started immediately after the revolution. The doors of higher and secondary specialized training establishments in other republics were opened up for the youth of Bashkiria, including the indigenous youth. The RSFSR People's Commissariat of Health began to send specialists to the republic each year.

Thanks to the rapid development of production forces in Bashkiria, already from the time of the 1st Five-Year Plan the question arose of opening a medical institute in Ufa and expanding training for middle-echelon medical personnel. In 1932 a medical institute was opened in Ufa, and in 1937 it graduated 83 physicians. Before the onset of the Great Patriotic War the institute graduated 625 physicians, including 161 representatives of the indigenous nationalities, many of whom returned to the remote regions of the republic. Before the revolution only two Bashkirs had ever succeeded in obtaining their physician's diploma. The opening of the medical institute made it possible for there to be 1,027 physicians in the republic by 1940, with 1 physician for every 3,125 persons, that is, 6.4 less compared with the prerevolutionary period.[sic] Despite the fact that during the years of the Great Patriotic War many of them went to the front never to return, the number of physicians continued to grow because of the expanded training. In 1950 some 310 physicians graduated at the same time, that is 2.2 times more than in 1913. The total number of physicians in the republic at that time was 2,235, or 6 per 10,000. This was a significant step toward bringing the availability index close to the average for the country as a whole, which was then 14 physicians per 10,000. The gap was closed even more rapidly in the postwar years. In 1960 Bashkiria had 12.4 physicians per 10,000, in 1970, some 16.8, and in 1980 the figure was 28.7. During these years the gap in availability was 28.5 percent. Typically, within the Bashkir ASSR the change in physicians was qualitative as well as quantitative. Whereas before the revolution the overwhelming majority of them were general practitioners, even by the prewar years many physicians with various specialties appeared. Their numbers increased rapidly in the postwar years. These changes occurred particularly during the Seventies. In 1977 the republic had 5.8 times more therapists than in 1940, along with 9.1 times more surgeons, 9.6 times more gynecologists, 10.9 times more pediatricians, 6.5 times more ophthalmologists, 15 times more otorhinolaryngologists, 14.7 times more radiologists, 10.5 times more neuropathologists, and 5 times more dermatologists and venereologists. In 1940 there was only one stomatologist in the republic; in 1977 there were 324. There were no traumatologists at all in 1940; in 1977 there were 122.*

* M.S. Safin. "Meditinskiye kadry Bashkirii za 60 let" [Medical Personnel in Bashkiria in the Last 60 Years], Sovetskoy zdravookhraneniye" 1979

Similar changes also took place in the training of middle-echelon medical personnel. During the Thirties several medical technical schools were opened. In 1940 they graduated 591 people, that is, 73 percent more than in prerevolutionary Russia; availability grew by a factor of 12.9. With each subsequent year the number of medical workers constantly increased, and by 1950 availability had risen to 21.0 per 10,000, in 1960 to 48.9, in 1970 to 60.7 and in 1980 to 89. In terms of availability the republic has come very close to the all-union average. Whereas in the prerevolutionary period this index was 1.1 per 10,000 and 2.7 times less than for the country as a whole, in 1978 the gap had been closed to 12.6 percent.

Soviet power and the CPSU opened up a broad path for formerly oppressed peoples to come close to the general level of medical care. And the more socialist society has developed, the more convincing the true equality of Soviet people has become. This is promoted by the right of each citizen of the USSR to health care, as stated in article 42 of the constitution.

As a result of the steps that have been taken, as the 60th anniversary of the USSR approaches, Soviet public health is marking up significant achievements. Within the RSFSR, during the period 1965 through 1981 alone, public health expenditures increased from R3.8 billion to R8.3 billion, that is, by a factor of 2.2. Within the health care system the number of hospital beds rose to 576,000, while the availability of beds for the public grew from 97.6 to 131.1 per 10,000. The availability of physicians and middle-echelon medical personnel increased significantly. Physician availability grew from 24.8 to 41.3 per 10,000, and middle-echelon medical personnel from 77.0 to 113.9. This made it possible to significantly improve staffing at primary health care facilities. From 1971 to 1980, staffing at therapeutic sectors increased from 85.8 to 95.8 percent, at pediatric sectors from 80.8 to 97.1 percent, and at shop sectors from 92.5 to 97.6 percent. Physician staffing for emergency medical care facilities, rural sector hospitals and outpatient department also grew. All this meant that during the period 1970-1981 the number of medical visits per capita increased from 10.5 to 12.3 for the urban population, and from 3.3 to 5.2 for the rural population. One of the most important tasks is to bring these indexes much closer together.

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STATUS OF AND PROSPECTS FOR DEVELOPMENT OF OUTPATIENT POLYCLINIC FACILITIES
FOR RURAL POPULATION IN MOSCOW OBLAST

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[Text] In the materials of the 26th CPSU Congress and the CPSU Central Committee and USSR Council of Ministers decree "On Measures To Further Improve Public Health" (1977), targets were set for strengthening the central regional hospitals and oblast hospitals and improving the work of rural sector hospitals and outpatient departments with the aim of further improving medical care for the rural population and improving its quality, including maximum satisfaction of the needs of rural inhabitants for highly qualified and specialized medical care. Medical personnel in the Moscow area are working for the successful resolution of the tasks set.

In terms of population size and the concentration of industrial and agricultural production, Moscow Oblast is the largest economic region in the country. The demographic processes taking place in this oblast are those typical of regions with a high economic development level: low birth rate, demographic ageing of the population, increased mortality from cardiovascular diseases, increasing urban population and shrinking rural population. During the period 1926 through 1980, the proportion of the rural population declined from 74.0 to 24.8 percent.

The rapid rates of urbanization have had their effect on the development of public health in the oblast and determined its specific features, which have been reflected in the structure and status of the network of therapeutic-prophylactic establishments and their capacities, the availability of medical personnel, the degree to which the population's requirements for outpatient polyclinic and hospital services are satisfied, and the level of development for basic and specialized kinds of medical care. Now, under conditions of inadequate capacities at the oblast's medical establishments, resulting from historical causes, preferential development is being given to the city hospitals and polyclinics, while the average number of beds in the central rayon hospitals is 524.

As in other krays and oblasts, outpatient polyclinic services for the public in the Moscow area are provided in three stages.

The first stage is represented by 96 sector and 8 rural rayon hospitals, 181 rural medical outpatient departments, and 873 midwifery points. This kind of network for the therapeutic-prophylactic establishments is promoting approximation of the outpatient polyclinic services for the rural population. However, the staffing at a considerable number of establishments in rural localities make it possible to handle only one or two main specialties (81.7 percent of outpatient departments and 48.6 percent of hospitals).

At the rayon level, rural inhabitants receive outpatient polyclinic care in 21 to 30 specialties in all the central rayon hospitals and other city hospitals and polyclinics.

At the oblast level, consultation is provided by 15 oblast medical establishments, including the Moscow Scientific Research Institute of Clinical Medicine imeni M.F. Vladimirskeiy, which fulfills the function of oblast hospital.

During the past 20 years, work has been done in Moscow Oblast to improve the organization and quality of outpatient polyclinic care for the public. Physician availability has risen 13.0, to reach 29.3 per 10,000. In the urban and rural establishments the function of the medical duty has been enhanced, reaching about 6,000 visits annually. The total volume of outpatient polyclinic care for the rural population has more than doubled, and for the urban population it has increased by a factor of 1.7. A sufficiently objective idea of the volume of medical outpatient polyclinic care is provided by a study of the rate of visits by the public to physicians of all specialties. In 1980 this index was 7.3 per rural inhabitant and 10.4 for urban inhabitants. At the same time, the level of provision of medical care for rural inhabitants was raised.

Analysis of the distribution of rural inhabitants in terms of physicians in respect to the stages of medical care has made it possible to elucidate the role of each stage in the provision of outpatient polyclinic care. It has been established that during the last two decades the increase in outpatient polyclinic care for the rural population in the oblast has been provided mainly by the urban public health establishments, to which 46.3 percent of all medical visits by the rural population were made in 1980 (see table 1). Over the past 20 years visits by the rural population to urban therapeutic-prophylactic establishments have increased by a factor of 2.7.

Table 1. Distribution of Visits by Rural Population to Physicians at the Stages of Medical Services, 1980 (as a percentage)

Stage of Medical Care	Physician Visits
Rural medical sector	53.7
Rayon level public health establishments including:	44.8
central rayon hospital polyclinics	22.9
polyclinics and polyclinic departments	
at other city medical establishments	21.9
Oblast medical establishments	1.5
Total	100.0

Despite the fact that within the oblast the volume of outpatient polyclinic care at rural medical sectors has approached the optimum at almost four visits for each rural inhabitant, specialized care at rural medical sectors has been offered only by isolated outpatient departments in some of the rayon and noncategorized rural sector hospitals and the largest medical outpatient departments. Because of this, the rural population receives the main volume of specialized outpatient polyclinic care at the rayon level. And, in addition to the polyclinic departments of the central rayon hospitals, other establishments located in the urban settlements on rayon territory also play an important role in providing medical services. These urban polyclinics and hospitals are bringing outpatient care for the rural population close to the overall level for neuropathology, otorhinolaryngology, ophthalmology, physiotherapy and so forth. Information on visits by the rural and urban populations to physicians with narrow specialties (otorhinolaryngology, rhematology, gastroenterology, nephrology, endocrinology, and so forth) is shown in table 2.

Table 2. Specialized Outpatient Polyclinic Care for the Oblast Population at Personal Level, 1980 (per 1,000 inhabitants)

Stage of Medical Care	Number of visits to specialists	
	Rural	Urban
Rural medical sector	309.3	-
Rayon level public health establishments including:	1,448.0	3,053.7
central hospital polyclinics	806.1	1,023.3
polyclinics and polyclinic departments		
at other city medical establishments	641.9	2,030.4
Oblast medical establishments	70.1	72.4
Totals	1,827.4	3,126.1

Material from the study indicates extensive participation by city public health establishments in outpatient polyclinic care for the rural population and inadequate capacities at the polyclinic subdivisions of oblast medical establishments in the Moscow area. As a result, the main load falls on the rayon stage polyclinics, which each year use an increasing proportion of their capacities to provide medical care for the rural population. This circumstance is also explained by the fact that in recent years improvements in the indexes for medical care for the rural populations in the oblast have been accompanied by stabilization of the volume of outpatient polyclinic care for the urban population.

By comparing the levels of outpatient polyclinic care for the urban and rural populations in the oblast with existing normatives it was possible to establish that the volume of outpatient polyclinic care for the urban population is not only lagging behind the normatives calculated by the USSR Ministry of

Health for 1980-1985 but is also lower than the level achieved in 1975 in the RSFSR and the USSR. The needs of the rural population for this mass kind of medical care are also not being satisfied, especially for neuropathology, otorhinolaryngology, ophthalmology and a number of other specialties.

In the existing situation, further improvement in medical care for the rural population is an integral part of improvements in the system of outpatient polyclinic for the entire population of the oblast. In the conditions prevailing in the Moscow area a whole series of measures must be implemented at all stages of health care.

In improving the network of rural public health establishments and the activities of out-of-town medical teams from the central rayon hospitals, greater consideration should be given to the features of population settlement and the continuing development of major agricultural enterprises of the industrial type in the rayons of the oblast. Major medical outpatient departments equipped with everything needed to deliver therapeutic-prophylactic care for the inhabitants and the workers in the main agricultural professions are promising for the Moscow area.

The developing process of further expanding outpatient polyclinic care for the rural population in urban public health establishments requires constant improvement in their work, reinforcement of prophylactic activities, expansion of dispensary services, and a considerable improvement in supplies of medical apparatus and equipment. In addition, provision should be made for a very significant growth in their capacities. Calculations show that, taking into account services for the rural population throughout the oblast, it is necessary to additionally introduce facilities at urban polyclinic establishments for 16,000 visits per shift, and operate two-shift working conditions.

In the rayons, increased capacity for outpatient polyclinic establishments in urban settlements should be used mainly to develop specialized kinds of medical care for the urban and rural populations, in cardiology, pulmonology, endocrinology, gastroenterology, neuropathology, otorhinolaryngology, ophthalmology, orthopedics and urology, and to develop the network of departments and consulting offices devoted to restorative medicine.

Because of the inadequate capacities of the oblast medical establishment to approximate and satisfy more completely the needs of the urban and rural populations for specialized outpatient polyclinic care, the need has arisen to organize consultative-diagnostic centers at some of the major central regional hospitals. Taking into account the features of population settlement and medical zoning in the oblast, it is advisable to organize seven of these inter-rayon (regional) centers, which in terms of structure and function should be consultative-diagnostic polyclinics as envisaged in the USSR Ministry of Health order "On Measures to Improve the Organization of Work at Outpatient Polyclinic Establishments." Their creation will significantly enhance accessibility to specialized medical care.

A realistic basis for improving and developing outpatient polyclinic care for the rural population in the oblast can be found in the decision of the

Ninth Session (1982) of the Moscow Oblast Soviet of Working People's Deputies on Public Health, which provides for the commissioning during 1982-1985 of outpatient polyclinic establishments handling 23,710 visits per shift.

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SCHOOL FOR SCOLIOSIS SUFFERERS

Moscow LITERATURNAYA GAZETA in Russian No 5, 2 Feb 83, p 15

[Article by A. Kobets: "The Joy of Movement"]

[Text] In 1964 the Central Scientific-Research Institute of Trauma and Orthopedics imeni N. N. Priorov opened the first boarding school in the world for children with scoliosis. As Professor I. Kon, the permanent scientific director of the boarding school, remembers, it was necessary to start from scratch.

Today the Moscow Boarding School Number 76 is a small village. The school itself is an unusual one. One should just look in on a lesson in one of the classrooms to become convinced of this. You will not see any school desks. All of the students (and there are no more than 20 per class) lie on specially-equipped couches. The children do written work while lying on their stomachs. This unusual position is essential for the children in order to relieve pressure from the spine. There is increased pressure in a sitting position.

The sleeping areas of the boarders are also unusual. Each bed holds a cast of the child's back, the so-called cast bed. In the boarding school it is also possible to change braces, which are essential for many of the sick.

The struggle against scoliosis using medical means goes on 24 hours a day at the boarding school (and children may stay here as long as it takes to correct their problem). For this reason, when the skeleton completes its growth, most of I. Kon's patients forget about their ailment forever. A large role in this is played by the special environment that is maintained in the boarding school by the teachers and doctors.

"Our attitude is that there are no sick children here," says the director of the boarding school, B. Suponitskiy, "We try to instill this attitude in the children as well. They do not receive any special considerations in their lessons; in fact, our requirements are higher than in regular general education schools. By giving the children a great deal of work we take their minds off their condition and we let them understand that scoliosis is correctable."

The conservative and operational tactics supplement each other. In accordance with a theory proposed by the deputy director of the institute, A. Kaz'min, TsITO [Central Scientific-Research Institute of Trauma and Orthopedics imeni N. N. Priorov] developed methods for intervening in the spinal discs, a procedure known as discometry. A study of the long-term results of the operation over the last 15 years showed the high degree of effectiveness of this form of treatment for scoliosis.

The school schedule includes not only general subjects, but also therapeutic gymnastics as well as swimming in a pool. Such a schedule would be the envy of the students of any school.

Today there are about 50 schools in the country similar to this one. But the first boarding school for children with scoliosis remains the best. The "miracle-working" clinic does have its difficulties. The medical personnel is subordinate to two groups--most of the doctors are counted in the 37th Children's Clinic, but work in the boarding school. At any time the clinic could call back its subordinates for its own needs, and at a time like this the administration of the boarding school would be left with empty hands. The personnel problem remains acute because in contrast to other medical workers in other boarding schools,, who receive 15-25 percent bonus with their wages, the workers in institutions treating scoliosis do not.

I. Kon feels that there will be even more problems for the school after the appearance of this issue of LITERATURNAYA GAZETA.

"Why are you writing about us?" he says, frowning. "After this issue appears we will be deluged with requests for places in the boarding school. And where can we put everyone? All 750 beds are occupied."

But I know that somehow, no matter how great the influx of the sick, an attempt will be made to treat and help each patient.

8228
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MOTHER AND CHILD HEALTH

Leningrad LENINGRADSKAYA PRAVDA in Russian 16 Jan 83 p 4

[Article by T. Chesanova: "Be Healthy, Child"]

[Text] The trolleybus quickly brought us it seemed to the very edge of the city. Behind us remained well-built rows of homes and wide streets. And it seemed that the windows of a five-story snow-white building were lit up on their edge. Everyone who got off together with me on Malaya Balkanskaya ulitsa--the turnaround point of trolleybus No 47--hurried to it also.

The information window was especially lively--someone was persistently asking about the well-being of a happy mother and her firstborn, someone had finished writing a kind note, someone was carefully packing a parcel.

A vacant lot--an enormous field powdered here and there with snow--was easily visible from the window of the chief physician's office.

"A time will come and no trace of this vacant lot will remain," said Lyudmila Vasil'yevna Krayneva, having guessed my question. "Here on the very south edge of Frunze Rayon will grow an entire health city: a medical and sanitation unit of the Elektrosila Association, a children's infection hospital and polyclinics both for adults and for children. Only our maternity home has yet been constructed. It is the first in the rayon and therefore has become the number one construction project and they waited for it with special impatience."

The city's currently largest maternity consultation office was located in the same building with the new maternity home so that the hospital and polyclinic physicians worked in the closest contact. And this is the way it is. Patients with the risk group, as the physicians say, come under their special care. That is, those who suffer from some general diseases or earlier had complications and now need especially careful observation.

Therapeutic physical culture and physical therapy have now come to assist them. Lyudmila Vasil'yevna proudly points out the large rooms equipped with everything to give strength to the numerous female patients. If need be, they go through a course of preventive treatment in this same building in a specialized department. The conditions here are excellent: light rooms, mainly one- and two-bed, comfortable halls and caring personnel.

The joy of motherhood. Many centuries ago an artist painted on canvas a young woman playing with an infant. If he had done only this, we would all know his name--Leonardoda Vinci. And now after five centuries, stopping in front of his "Madonna and child," sad viewers fall in love with the mother's smile--so happy and serene.

However, nature has already arranged it: every new life that has just appeared in the world is always a struggle. It is daily and hourly labor for the enormous army of medical personnel. This is special labor because they are struggling simultaneously for two lives, each of them invaluable.

The new maternity home was designed for 250 beds and has been operating for more than 2 months. This is a new home and all the medics in the collective have extensive experience. Among them are the deputy chief physician V. I. Verekha, department head L. I. Shishkina, physicians L. A. Kol'tsova and T. Kh. Gorodinskaya, chief pharmacist L. P. Filatova, senior nurses A. N. Belaya and G. G. Shmatok and others.

Chief physician L. V. Krayneva has been fighting for the health of mothers and their children for more than 20 years. She defended her candidat dissertation several years ago. The recommendations contained in it became part of extensive medical practice.

"I am very glad that the new maternity home has become the clinical base of the State Institute for Raising the Qualifications of Physicians imeni S. M. Kirov. Physicians from all ends of the country will now come here to Kupchino for experience."

Construction of this maternity home was provided by the specific complex program for further development and improvement of maternity and childhood health service, worked out at the Main Administration of Health of the Ispolkom of the Lengorsoviet. According to statistics, the birth rate in our city, although slow, is increasing. And this of course is gladdening, including for physicians as well. For their work to be successful, new maternity homes, consultation offices and specialized centers are being constructed in Leningrad.

I went out onto the street. Not far away stood a small boy of about six. "Mama! Mama!" he yelled, looking into the lighted window. And regardless of how much his grandmother standing alongside tried to calm him, he only wanted to find his mama, not a brother or sister who now appeared in his life.

6521
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ROLE OF PUBLIC HEALTH IN 26TH CPSU CONGRESS SOCIAL PROGRAM

Moscow SOVETSKAYA MEDITSINA in Russian No 11, Nov 82 (manuscript received 16 Jan 82) pp 75-79

[Article by K. K. Kuz'min (Moscow): "Social Program of the 26th CPSU Congress and Development of a Public Health System"]

[Text] Reinforcement of the interrelationship between a society's economic and social development is a distinguishing characteristic of developed socialism. This was reflected in decisions of the 26th CPSU Congress in a comprehensive program of the country's socio-economic progress into the 11th Five-Year Plan and the entire period of the 80's. In addition to the task of further improving the aggregate of socio-economic living conditions of the workers and enhancing their welfare and culture, the CPSU and the Soviet government attach a great deal of importance to the public health system.

Public health is charged not only with solving medical problems, but with administering extensive socio-economic and public health measures for improving conditions for people's work, everyday life, and leisure. All of this strengthens the influence of public health on achieving the basic law of socialism and also on the question of the social policy of the CPSU and the Soviet government.

Public health participates in solving the socio-economic problems posed by the 26th CPSU congress primarily by improving the work and living conditions of the people. "Creating the most advantageous conditions for high-productivity labor, increasing its creativity, cutting back in every possible way on manual unskilled and heavy physical labor, and improving labor safety procedures and safety technology," are provided for in the "Program for social development and improvement of the people's welfare" adopted by the 26th CPSU Congress.

A great deal of importance is attached to improving health and labor hygiene conditions and perfecting safety technology and production sanitation. An average 1.6 billion rubles per year were spent on labor safety procedures in the 9th Five-Year Plan, whereas 2.2 billion rubles were spent in the 10th Five-Year Plan. The result of this was that in 1980 industrial accidents in the area of physical production were 35% lower than in 1970. Worker occupational disease was also 25% lower than in 1975.¹ Cutting down on lost work

time due to temporary worker and employee disability by introducing a combination of prophylactic, sanitary and therapeutic measures has had a very great influence on the national economy. According to statistical data, reducing industrial worker illness and reducing illness-related absence from work by just one day results in an additional 32.5 million work days per year. A reduction in illness such as this can save 6994 thousand work days in construction, the equivalent of freeing up 30,000 construction workers.²

Use of these resources is a necessary element in increasing production. When labor resources are strained, decreasing the amount of time lost due to temporary disability by using labor resources efficiently and increasing each worker's productivity is an important factor in living labor economy.

Bettering the socio-psychological working conditions, improving the microclimate in the collective, is an important direction in carrying out social policy in the area of labor. In order to assure a healthy moral and psychological climate in the labor collective, a special role is designated to social hygiene regulation of all facets of people's social relationship in production and in private life. A number of measures, designed to improve mental health relationships in the factory and in the microenvironment should be included more extensively in social development planning for labor collectives. The development and implementation of psycho-physiological and health standards of labor activity and consumption based on scientific recommendations and the inculcation of hygienically and socially healthy forms of behavior and contact in people will increase their concern for preserving personal and collective health. All of this will not only improve the working, moral-psychological tonus of the collective, but will also help to strengthen the collective and humanistic bases of the socialist way of life.

The social program of the 11th Five-Year Plan continues the implementation of the party's long-term course on improving the people's welfare and on bringing the socio-economic positions of different groups of society closer together. Pay and public consumption fund benefits, including the part allocated to free medical care, are becoming increasingly important in terms of equalizing standards of living of various segments of the population.

Important social problems as well as medical ones are solved on the basis of public consumption funds use in public health: the level of medical care of urban and rural populations is becoming more equal, socio-economic and cultural-domestic living conditions of all groups of the population are balancing out, differences in worker personal consumption levels due to existing social inequality of work, with uneven distribution of able-bodied persons among different families, etc., are becoming less. In particular the effect of free medical care and other payments and benefits from public health consumption funds on the increase in income of each family is extremely significant. According to economic research data, in a number of Union republics the amounts per blue and white collar worker in the form of free medical service are approximately 6% of real income. It is also known that in a socialistic society approximately 45% of the cost of drugs issued is covered by the government, resulting in a systematic lowering of price per drug.

Approximately 36% of the government budget goes to public health and social security, together with education. The government spends approximately 300 rubles per year on health care for a family of four, not counting the cost of maintaining scientific research institutes and medical colleges. With government allocations for public health constantly increasing, the tendency toward the increase in incomes in each family's budget due to free medical care is becoming increasingly evident.

A further increase in public consumption funds was outlined in the 11th Five-Year Plan, in conformity with a CPSU 26th Congress directive. In 1985 this will be 144 billion rubles, 23% greater than in 1980. This definitely strengthens the role of public health in the solution of a whole array of problems of CPSU social policy in the modern era, particularly in accomplishing the task of "equalizing social differences, so to speak, in the territorial plan," equalizing the living conditions of people in various areas of the country proposed in the Central Committee accountability report at the 26th Party Congress.³

A solution to public health problems is urgently needed in the overall process of eliminating social differences of a regional nature. The problem is that the existence of definite differences in medical care for the populations of various republics and areas of the country together with other social differences has negative repercussions for the economic plan, particularly complicating the labor resource situation in a number of places. Therefore, more even distribution of the medical care network into the country's territories must be achieved, the quality of treatment must be improved, and it must be made accessible to all inhabitants of various areas of the country. This provides an effective solution to the socio-economic and demographic problems to be carried out: to bring about a meaningful change in migratory patterns, and, in particular, to increase population influx into the newly-developed areas of the far east, Siberia, and the north.

Eliminating differences in the amount and quality of medical services for the populations of the different republics and rayons is a necessary condition for making the nations and nationalities of our country truly equal in all areas of public life.

A significant increase in the 11th Five-Year Plan public consumption funds reveals new possibilities for improving the social security system. By expanding socio-economic guarantees for the Soviet people's right to material security in their old age, in case of illness, full or partial disability, and also in case of loss of the breadwinner, the Party and the government are accomplishing this most important constitutional norm. This was reflected in decisions of the CPSU 26th Congress and a decree by the CPSU Central Committee and the USSR Council of Ministers "Measures for further improving public social security." In conformity with these documents, measures are being taken at the present time to increase the minimum amount of worker and employee age pensions to 50 rubles, and also to increase minimum disability and loss of breadwinner pension amounts. Further equalization of social security conditions for kolkhozniks and government enterprise workers, improvement of the boarding home network for retirees, and raising the level of public services and social and personal services in them were also assured.

The government allocates significant amounts for these and other measures. In the 1982 USSR government budget, expenditures for social insurance were 39.4 billion rubles. In all, for the 11th Five-Year Plan, the government spent almost 6 billion rubles in addition for improving public social security. All of this reinforces the social hygiene direction of social policy, emphasizing its humanistic nature.

An important direction in accomplishing the CPSU 26th Congress social program is the enactment of measures for strengthening the family, an increase in government aid to families with children, and further improvement of conditions for the work, everyday life, and leisure of working women. Imbued with concern for the health care, happiness and well-being of the people, these active demographic policy measures have a clearly defined social hygiene character.

In conformity with the need for meaningful regulation of the national population dynamics of the country and for optimization of the demographic processes in the decisions of the 26th CPSU congress in the decree recently adopted by the CPSU Central Committee and the USSR Council of Ministers, "Measures for increasing state aid to families with children," beginning in 1981 measures such as gradual introduction, by rayons, of partially paid leave for working women to care for their children up to the age of one year and additional unpaid leave up to the age of one and a half years have been provided for and are being carried out. Provision is made for an increase in state aid to unwed mothers up to 20 rubles per month per child with payment until the child reaches the age of 16, and up to the age of 18 for students not receiving a stipend. Part time work for women on a sliding schedule and also work at home must be practiced on a large scale. The duration of paid leave while caring for a sick child is also longer in the 11th Five-Year Plan.

More than 9 billion rubles are provided for in the Five-Year Plan for realization of measures to increase state aid to families with children. In three years of the current five-year plan alone, the material situation of more than 4.5 million families with children will be improved. The 12th Five-Year Plan provides for further extension of social guarantees to families with children, including an increase in duration and higher level of payments for leave for newborn and toddler care.

Institution of comprehensive demographic policy measures assures an efficient combination of public education with family education, a combination of motherhood with an active participation of women in work and public activity. These measures broaden health care possibilities for women who are mothers and for child and maternity care, and they add to concern for the coming generation. The medical and hygienic aspects and social measures of the demographic policy increase its significance as an important element of the economic and social development of the country.

Environmental protection and natural resources conservation measures are the realization of social guarantees connected with public health. Government expenditures for these goals increased by a factor of 1.5 in the 10th Five-Year Plan. In the 11th Five-Year Plan they comprise 10 billion rubles.

"Basic directions of economic and social development in the USSR from 1981-1985 and for the period up to 1990" contains specific directions of work on further improvement of environmental protection and efficient use of natural resources. The specific problem presented is that of improving technological processes and means of transport in order to decrease the release of harmful agents into the environment and to improve removal of harmful impurities from exhaust gases. Provision has also been made to increase production of highly efficient gas-dust-catching apparatus, of water-purifying apparatus, and also automatic stations for checking environmental conditions.

Public health has been called upon to contribute to the solution of this state problem. Public health organs, health and epidemiological services, and therapeutic-prophylactic institutions, in close cooperation with Party and Soviet organs, must participate actively in the work of preserving farmlands, soil erosion control, and improving protection of water resources from depletion and pollution. In this regard, there has been a particular increase in the role of government preventative and routine sanitary supervision of the conditions of work and daily life of the people, of compliance with hygiene requirements, and of the use of new types of materials and pesticides and herbicides.

Moreover, it is impossible to successfully accomplish a program of natural resource consumption in the USSR without systematic work in the area of popular ecological education. The people must be given a clear understanding of the basic principle of an intelligent, wise relationship with nature, an education of high ecological culture.

Therefore, inclusion of measures for preservation and improvement of the health of the Soviet people and of means of active social prophylaxis in the 11th Five-Year Plan's social program significantly strengthens the social and humanistic direction of the entire social policy and broadens possibilities for meaningful influence on all aspects of people's lives. Methods and forms of the social control of people's life style under socialism are based on and supplemented by health and medicine. All of this reinforces the regulatory effect of the CPSU and the Soviet government social policy on the economic and social progress of socialist society.

FOOTNOTES

1. Rogovin, V. Z., Volkov, Yu. Ye. Questions of social policy of the CPSU, Moscow, Politizdat, 1981, p. 150
2. "PRAVDA", 27/VIII 1976, 6/I 1978
3. Brezhnev, L. I. Accountability report of the CPSU Central Committee of the CPSU 26th Congress and immediate tasks of the Party in internal and external policy. Moscow, Politizdat, 1981, p. 63

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12262
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CHEST SURGERY CENTER OPENS IN TBILISI

Tbilisi ZARYA VOSTOKA in Russian 10 Feb 83 p 4

[Interview by Anna Malyugina with Professor Vakhtang Pipiya, director, Republic Thoracic Center: "Physicians Combine Their Efforts"]

[Text] The Republic's Thoracic Center was created in Tbilisi by combining thoracic departments (chest surgery) at the City Hospital No 1 and the Republic's Child Clinic. Similar specialized health-care centers are already functioning successfully in the Baltic republics, Novosibirsk, Sverdlovsk, Tomsk, and other cities of our country.

[Question] Vakhtang Ignatyevich, please, tell us, what are the circumstances surrounding the creation of the Thoracic Center in our republic?

[Answer] Unfortunately, in our republic, as well as in other republics, the number of persons suffering from pneumonia with complications, diseases of the bronchial-pulmonary system, and other chest diseases is increasing. Our medical practice shows that the treatment of patients suffering from acute and chronic pathology of the bronchial-pulmonary system based on traditional methods is not always sufficiently effective. However, the new center will combine efforts of physicians to fight serious diseases. It has two departments, one for children and the other for adults. Vladimir Volobuyev, the well-known surgeon, and docent at the Thoracic Surgery Department at the Tbilisi Institute for Training of Physicians of the USSR Ministry of Health heads the first department. Elgudzha Todadze, doctor of medical sciences, heads the other department. Over 50 qualified physicians, technicians, and nurses work in the center.

[Question] What are the center's objectives?

[Answer] The Scientific Research Center [NII] has to fulfill many tasks. The most important task is early diagnosis and rehabilitation of patients. First of all, in order to detect the ill, the whole republic has to be covered by qualified, expert staff that would implement the objectives of prophylactic treatment. With this objective in mind field facilities will open in Sukhum, Batumi, Tsinvali, Kutaisi, Rustavi, Chiyatura, and Zugdidi.

Our center will direct their activities. After all, our main objective is making the patient able to work again.

[Question] In your opinion, what are the most effective treatment methods?

[Answer] This question cannot be answered simply. In some cases we are helped by the most advanced technology, in other cases by surgical intervention. In any event, a modern thoracic clinic is not possible without endoscopic services. The center has modern equipment that enables it to solve current problems of chest surgery.

[Question] What are the center's plans in the near term?

[Answer] In order to perfect treatment methods, special offices for functional diagnosis, bronchial testing, X-ray diagnosis, and other needs will open in the center. Today the center is still in the developmental stage. When the services needed for a smooth functioning of the center are established, we will be able to conduct scientific conferences and invite leading scholars and experts from various cities of our country with whom we have been maintaining contact for many years. We will also receive on a regular basis young physicians from all parts of Georgia who will come here to train and learn the most advanced treatment and diagnostic methods.

In February a group of our colleagues will go to a conference in Tomsk. They expect to become acquainted with the work of the Tomsk Thoracic Center.

9959

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SHIFTS IN THE COMPOSITION AND FERTILITY OF RURAL POPULATION IN KIGHIZIA AND ITS SANITARY SIGNIFICANCE

Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 6, Nov-Dec 82 pp 9-13

[Article by K.D. Abdullin, Chair of Social Hygiene and Public Health Administration, Kighiz State Medical Institute]

[Text] The composition and structure of a population are factors which enter into the planning and administration of health services. The rate of reproduction is one component that characterizes the general state of health of a population. On the other hand, the composition and mobility of a population are two interdependent processes which mutually affect each other.

The Kirghiz SSR has the second highest proportion of rural population in the USSR (61.3%) after Tajikistan. The average indicator for the USSR is 38%, while the lowest figures are encountered in Estonia (30%), Latvia (31%), and so forth.[1]. It is recognized that it is more difficult to provide health services for a rural population, particularly in mountainous regions such as Kirghizia. Consequently, this one figure alone (61.3%) underscores the difficult conditions under which our health services have to operate.

Table 1. **Shifts** in Age Structure of the Rural Population in Kirghiz SSR

Indicators	1926	1939	1959	1970	1979
Pediatric population (0-14 years old, as % of entire population)	36.0	36.3	33.5	47.4	43
Fraction of work-age population	43.7	44.4	42.4	34.9	22.7
Dependency coefficient (0-19 and 60 and over per 1000 20-59 year olds)	1013	1252	1358	1867	1643
Geriatric coefficient (60 and over as % of entire population)	5.3	7.8	11.0	3.5	7.9

The rural population of Kirghizia is characterized by a high percentage of children, ranging from 36% in 1926 to 47.2% in 1970, indicating high fertility (Table 1). The lower percentage of children in 1926 and 1939 was due to high childhood mortality and mortality of children older than one year. In the last decade the pediatric sector of the rural population decreased somewhat and in 1979 accounted for 43.1% of the population; this has been ascribed to a lowered birthrate in the rural population in the seventies. Children constitute 28.8% of the population in the rural areas of the Republic, and 28.3% in the urban areas. The high percentage of children in the population presents unique medical and sanitary problems. The major problems are as follows:

1. Morbidity and mortality patterns typical of children are at a high level in the population (childhood infections, gastrointestinal diseases, developmental anomalies, pneumonia, diseases of the skin and subcutaneous tissues, avitaminoses, metabolic disorders, hematopoietic diseases, etc.); the number of pediatric visits to medical establishments is increased; the indicator of childhood mortality is increased, e.g., in a multichild family the risk of infant death is increased (S.M. Bednyy, 1979); finally, the morbidity and mortality of the entire population is increased.
2. The percentage of children in the rural population of the republic varies with the region; this is largely due to the relative percentage of the indigenous nationality with its high birthrate. In 1979 in the Alamedinskiy rayon children accounted for 27.6% of the entire population, and in the Alayskiy rayon for 50.5%. Obviously, rayons with a larger child population require more pediatricians and pediatric patient beds. In the Alamedinskiy rayon in 1979 there were 2.3 pediatricians per 10,000 inhabitants, and in Alayskiy rayon 1.6 (a 1.4-fold difference).

The supply of pediatricians is usually calculated in relation to the entire population and not with respect to the pediatric population; consequently, statistics on the availability of pediatricians for regions with different pediatric populations cannot be readily compared. We have developed a "special pediatrician supply indicator" which takes into account the percentage of children in a given population and represents a special value derived by dividing the supply of pediatricians by the one hundredth fraction of the pediatric portion of the population, i.e.:

$$X = \frac{\text{supply of pediatricians}}{\text{pediatric portion of population}} : 100$$

On this basis, the "special pediatrician supply indicator" for the Alamedinskiy rayon is 7.9 per 10,000, and in the Alayskiy rayon 3.2; the actual difference in the availability of pediatricians is 2.5-fold, and 1.4-fold as usually calculated.

The work force is lower in the rural areas; in 1979 it was 22.7% for the rural areas and 50.9% in the urban centers of Kirghizia (Table 1). The decrease in this indicator is largely due to the increase of the aged and children in the population (the former because of increased longevity).

In view of the above, the coefficient of dependence in the rural population of the republic is 1643, while in the urban population it stands at 964.

The aged population of the entire rural population in the republic for 1959 accounted for 11% of the total; in the last two years this figure has decreased but is still higher than the prewar level. The high geriatric coefficient is also responsible for the high morbidity of geriatric problems (cardiovascular diseases, malignancies, visual disorders, chronic respiratory diseases, etc.), and results in the "accumulation" of a large segment of the population with chronic diseases, the treatment of which entails considerable efforts. Finally, an increase in the proportion of the aged population also raises the mortality for the entire population.

An important factor in the medical and sanitary aspects of a rural population is the nationality composition of the population. In the rural population the indigenous nationality is a major factor (80.4%), a fact which influences the function of the medical establishment. This is due to the fact that certain aspects of domestic patterns and traditions have a negative effect on the state of health, particularly of children, and present an additional barrier to the function of the health services. The percentage of the indigenous population varies greatly among the different rayons in the republic: it ranges from 23% in the Alamedinskiy rayon to 92.3% in the Sovietskiy rayon.

The spatial distribution of the population (density and local populations) have a significant effect on health services administration, as do other factors. Settlements located at some distance from one another are recognized to hinder the work of public health organizations. Certain rural rayons in the republic differ considerably from one another. For example, in the Issyk-Kulskiy rayon the number of settlements with a population of 500 or less (small villages) accounts for 17% of the settlements, while in the At-Bashinskiy rayon they account for 75% of the settlements. The respective populations densities (inhabitants per one square kilometer) are 42.4 and 2.1; the mean number of inhabitants per settlement is 1727 and 610, respectively.

Methodological difficulties are encountered in attempting to analyze the fertility of the rural population in Kirghizia due to the fact that the official data on the natural mobility of the rural population in Kirghizia (data according to TsSU [expansion unknown]) for the period reaching the mid-seventies are unreliable; the failure involved underestimation of birth rate and mortality and, for that reason, we employed the following three sources of information:

1. Expeditional investigations headed by A.I. Yarkho in 1928 on natural mobility of the rural population in Kirghizia in the 1926-1928 period.
2. Anamnestic studies head by K.D. Abdullin in 1972, involving expeditional investigations on the natural mobility of the rural population

in Kirghizia, covering the years 1950-1960. The methods underlying anamnestic studies on the fertility of a population have been described in detail in special publications (G.A. Babkos, 1964; V.V. Payevskiy et al., 1933).

3. For the second half of the seventies the official statistics on the mobility of the rural population in the republic have been utilized (TsSU, Kirghiz SSR).

It must be emphasized that indicators of natural mobility of the rural population in the sanitary sense are not considered in isolation, but as components of a wider ranging complex.

In the second half of the twenties the birthrate of the rural population in Kirghizia was very high and, in the period 1926-1928, reached 48.3 per 1000 inhabitants. However, because of "very high mortality" (25.3) the actual increment was relatively low (23.0) (A.P. Yarkho, 1930).

Childhood mortality was extremely high (246 per 1000 births; A.P. Yarkho, 1935). Consequently, in terms of fertility the high birthrate in the second half of the decade was essentially "ineffective".

The birthrate fell by almost a fourth in the period 1969-1970 in comparison with 1926-1928; however, mortality fell almost three-fold and the indicator of natural increase in the population increased by 26%.

In 1978-1979, in comparison with 1969-1970, the birthrate also decreased somewhat and the mortality stabilized; as a result, the indicator of natural increase in the population fell by 13%. Consequently, both in direct and sanitary terms the decrease in the birthrate of the rural population of Kirghizia in the seventies was an undesirable process.

Nevertheless, comparison of the birthrate at the end of the seventies (1978-1979) with that for the second half of the twenties (1926-1928) shows a decrease in the birthrate of the rural population in Kirghizia. It is obvious that in the last fifty or so years the birth rate fell by 30%, mortality fell 2.9-fold (including a 5.4-fold decrease in childhood mortality), and the indicator of natural population increase rose by 10%.

In the last ten years (from 1969-1970 to 1978-1979) the birthrate in the rural population fell by 8%. Detailed analysis has shown that this was due to a decrease in the fraction of married women (particularly women under 30 years) and deliberate practice of birth control (marital fertility decreased, i.e., the birthrate per 1000 married women).

An important characteristic feature of the sanitary state (health) of a population is the average longevity. In 1978-1979, in comparison with 1938-1939, the mean longevity of the rural population increased approximately by two-thirds. This particular indicator is lower in men than

in women by 11.2% (7.8 years). Consequently, in order to increase further the longevity of the rural population as a whole the figure for men must be improved.

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DEVELOPMENT OF SOVIET PUBLIC HEALTH AFTER 26TH PARTY CONGRESS

Moscow MEDITSINSKAYA SESTRA in Russian No 8, Aug 82 pp 3-9

[Article by S. P. Burenkov, USSR Minister of Health: "The Development of Soviet Public Health in the Light of the Decisions of the 26th Party Congress"]

[Text] This is the second year of the 11th Five-Year Plan. Each working day brings news about new successes by medical collectives, which are striving to fulfill with honor the decisions of the 26th CPSU Congress, the November 1981 and May 1982 plenums of the party's central committee and the goals of the five-year plan and which are preparing to greet the 60th anniversary of the formation of the USSR with dignity. Soviet medical personnel have interpreted immutable law and as a battle program the call of the Secretary General of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev, "We must do everything possible to make sure that the Soviet citizen living anywhere could receive modern, professional and quick medical help."

Thanks to the daily concern of the party and government regarding the protection and improvement of the health of the Soviet people, in the USSR public health and medical science have reached a high level of development, enabling us to make a weighty contribution toward solving social and economic tasks of building communism in our country. The 10th Five-Year Plan became an important stage in this direction. Party and state decisions regarding public health made during the years of the five-year plan were developed and made concrete by the decisions of the 25th CPSU Congress; specific goals to implement the decisions were indicated. A qualitatively new approach to improving health care was indicated by the resolution of the CPSU Central Committee and the USSR Council of Ministers of 22 November 1977, "On Measures to Further Improve Public Health."

During the years of the 10th Five-Year Plan significant financial and material resources were allocated for the needs of public health. Allocations from the state budget increased by a factor of 1.3 over the 9th Five-Year Plan and reached 66.6 billion rubles. The production and supply of medications for public health increased by a factor of 1.4; of medical technology--by a factor of 1.5. The supply of ambulances in medical facilities improved radically. The capital investments of enterprises and organizations, kolkhozes and sovkhozes began to be more widely applied to the building, renovation and equipping of medical units, hospitals and clinics. Hospitals with 323,000 beds and clinics for 650,000 visits per shift were put into operation. By late 1980

the total number of available beds in the country reached and surpassed 3.3 million, with a breakdown of 126 beds per 10,000 residents. Over 36,000 outpatient departments and clinics have been built in the country.

The volume of non-hospital medical services has increased. The number of visits to a doctor per urban resident increased by 11 percent; of a rural resident--by 26 percent. We have begun to implement a program to increase medical cadres in regional therapeutic and pediatric divisions, which has enabled us to strengthen regional services and to create the conditions for expanding prophylactic work. Emergency medical services have been unified. A new direction in improving emergency medical aid was the organization of emergency hospitals, the number of which has reached 87.

A great deal has been done to improve inpatient services. The growth in the number of beds is the result of new building, particularly of large multi-profile and specialized hospitals. At the present time 82 more complexes are being built for over 600-1,000 beds each. It is these facilities that determine the general high level of medical aid to the residents of entire regions. Intensive therapy and physical therapy services have developed actively. A new direction is the introduction into practice of methods of rehabilitative medicine.

Various forms of specialized services have been intensively developed. Cardiological and anesthesiological services have been established. The number of specialized centers has grown significantly. In Moscow all-union cardiological and oncological research centers have been established. In the country there is a broad network of centers for eye microsurgery, chronic hemodialysis, kidney transplants and other services.

Improvements continued in the medical services provided for workers in industry, building and transportation. The network of medical units expanded and shop services, especially in regional clinics, improved. One progressive direction taken was the organization of sanatoriums and preventative medicine facilities as an important component of treatment-recuperative measures implemented for workers and employees. During the five-year plan over 12.4 million persons were treated here.

In the area of rural public health special attention was given to strengthening central rayon hospitals as centers of specialized medical aid to rural residents and to improving oblast hospitals. The number of rural outpatient departments increased by almost 40 percent. Mobile medical units were developed. New state norms were introduced for medical personnel of central and divisional hospitals (outpatient departments) in cities and settlements with a population of up to 25,000, which enabled us to increase the staff by 60,000 doctors, 80,000 intermediate and 43,000 junior medical personnel.

Measures have been realized to improve health protection of the mother and child. The network of pediatric clinics and hospitals, maternity houses and antenatal clinics has expanded. The All-Union Scientific-Research Center for the Protection of the Health of Mothers and Children was established in Moscow. There is continued development of specialized maternity houses and departments of

obstetrical pathology, pediatric departments for the treatment of neonates, and premature infants, physical therapy and intensive care. The network of gynecological clinics and marriage and family consultation services is growing. The industrial production of items for children's nutrition has increased.

State budget expenditures for the protection of the environment and for the efficient utilization and reproduction of natural resources increased by a factor of 1.5 during the five-year plan. The medical epidemiological service strengthened its overseeing of the fulfillment of measures in this area by ministries and departments. As a result we have secured the medical-epidemiological well-being of the country, improved air quality and improved conditions of many rivers and reservoirs.

Improvements in medical education continued. The number of students accepted by the pediatric, stomatological and pharmaceutical departments increased. Seven pediatric and 12 stomatological departments were newly organized. The training of pharmaceutical chemists and pharmacists expanded. The number of physicians reached 1 million; of intermediate medical personnel--2.9 million, including over 1 million nurses. Medical school admissions during that period increased by 22,100 persons. The system of supplementary training of physicians and pharmaceutical chemists improved. A system for improving the training of intermediate medical personnel began to be implemented.

During the years of the 10th Five-Year Plan the front of basic and clinical research expanded. New effective methods and means of preventing, diagnosing and treating patients with hypertension and ischemic heart disease, malignant neoplasms and pulmonary and other diseases have been put into practice. Significant successes have been achieved in surgery. About 200 new medications have been introduced for use and over 900 modern articles of medical equipment have been elaborated. The resolution of the CPSU Central Committee and the USSR Council of Ministers, "On the Further Development of Medical Science in the Regions of Siberia and the Far East" (1979) played an important role in improving public health in the eastern regions of our country. Cooperation has increased in the area of medical science and public health with regard to foreign countries and has been especially fruitful as concerns socialist countries.

Continued improvements in the health of the population have occurred as a result of socio-economic transformations during the 10th Five-Year Plan, improvements in the standard of living of the Soviet people, scientific progress and improvements in the treatment and prevention of disease. Temporary inability to work dropped per case by 11.5 percent, per days by 8.1 percent. Job-related illnesses decreased by 26 percent and departures from jobs due to injury--by 8.3 percent. The drop in mother and infant mortality rates increased and the birth rate increased.

The selfless labor of physicians, scientists, nurses and other health workers has facilitated the fulfillment of goals during the 10th Five-Year Plan. Many collectives achieved high indicators in all-union socialist competition. The best of them were awarded the challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the All-Union Trade Union Council and the

and the Komsomol Central Committee. Seventeen thousand branch workers were awarded USSR medals and orders for the successful fulfillment of the goals of the 10th Five-Year Plan. Many have been awarded the great title of Hero of Socialist Labor. Over 520,000 persons have received "Shock Worker of the 10th Five-Year Plan" and "Victor of Socialist Competition" pins.

There were many successes involving protecting and strengthening the health of the Soviet people. However, there are still many shortcomings in supplying the population with medications and medical supplies. This was pointed out by Comrade L. I. Brezhnev in his keynote speech at the 26th CPSU Congress. In the period following the congress significant organizational work was completed in the area of realizing goals set by the party and state regarding health care during the 11th Five-Year Plan, eliminating shortcomings in health services in the shortest possible time and providing better quality medical aid and pharmaceutical services.

Organs and directors of public health enterprises, department chiefs, senior specialists, senior and chief nurses and the entire medical profession have been called upon to increase their personal responsibility for fulfilling their obligations, for creating in medical collectives a high degree of demandingness and an atmosphere of intolerance toward shortcomings and violations in work, toward those who do not adhere to the principles of communist morals, the norms of medical ethics, those who violate the oath of the USSR physicians. It is essential to take decisive measures in each case of a violation by a medical worker of his professional duty, in each case of negligence, callousness and lack of compassion. We must activate public control over the operation of medical facilities. We must increase the role of nurses' councils in this area. We must strengthen ties with the population. Here the reports of health and pharmaceutical facilities to the population are very helpful. In 1981 there were 60,000 such reports.

The 26th CPSU Congress established the main directions for the development of public health. It called for implementing extensive measures to further develop and strengthen the material-technical base of public health and medical science. The number of hospital beds will increase by 8-10 percent, which will enable us to continue replacing old buildings and which will increase inpatient services to the population. New outpatient clinics with a capacity of hundreds of thousands of visits per shift will be put into operation. Public health facilities will be better supplied with medications and supplies. During the 5-year period the production of medications will increase by a factor of 1.4.

The USSR Health Ministry has determined a series of measures to improve the organization of work in clinics, the treatment and diagnostic process and to actively introduce modern methods for treating and diagnosing patients. The very approach toward improving the quality and level of outpatient services is changing. A program for technically reequipping clinics has been developed. Rehabilitation treatment in large clinics is growing. The network of inter-rayon diagnostic laboratories and diagnostic clinics as well as pharmaceutical affiliates is expanding.

With the aim of increasing the effectiveness of the health center system and the prophylactic check-up it is planned to create prophylactic divisions in large clinics to provide check-ups, vaccinations, etc. The 11th Five-Year Plan will become the springboard for implementing measures to prevent the most widespread non-infectious diseases, particularly cardiovascular, oncological and pulmonary diseases, diabetes, and so forth. Children, adolescents, women, workers of the leading branches of industry and agricultural production and individuals at risk should receive regular medical check-ups.

During the 11th Five-Year Plan a great deal of attention will again be focused on strengthening regional services and on completing a program of expanding medical facilities. By 1985 one uchastok doctor-therapist will serve 1,700 adults, which will enable him to expand preventative work first of all.

Questions that continue to remain urgent involve organizing the work of clinics, improving the work of registries and securing the unfailing admission of all patients in all specialties. Long waits for the physician during appointments are to be eliminated.

The responsibility of the intermediate medical personnel, especially nurses, increases as regards solving the problems standing before the primary link of public health services. Nurses must more effectively help doctors in the treatment-diagnostic process, in the health care center system and in implementing accounts-statistical work in the health center system. Intermediate medical personnel of other subdivisions of outpatient departments and clinics must also increase their contributions in this important matter. It is also important to more actively participate in the medical education of the population, in propagandizing a healthy form of living.

The entire medical profession has a great task in further improving the level of preventative and medical aid to women and children. During the 11th Five-Year Plan the strengthening of the basic link in pediatric services will continue--pediatric clinics and pediatric divisions, the development and improvement of the most important types of specialized medical services for children. All cities must establish pediatric brigades for emergency services. Large cities must establish emergency services for newborns.

Other urgent goals include improving the quality of health care for sick and well children and pregnant women, decreasing the incidence of illness, and decreasing the mortality rate for maternity patients, fetuses and neonates, and children. Pediatric divisional nurses and medical nurses in preschools and schools as well as other children's facilities must secure the proper patrons, must ferret out the sick children in a timely fashion and send them to doctors, and must work to prevent colds, flu, measles, parotitis and other infections and to keep them from spreading throughout the children's collectives. It is essential to improve prenatal care of pregnant women. All pediatric and midwife-gynecological stations must adhere to a model sanitation and hygiene regimen.

The effective utilization of beds and improvements in the care of the sick become especially important under present conditions. With this aim in mind

hospital operations are improving and two-level services for sick patients in hospitals are being provided. Medical nurses are combining their basic functions with the obligations of junior nurses as regards the care of the ill. The main roles of chief nurses in hospitals and departments involve securing the appropriate conditions of care for the ill in hospitals and the timely and precise fulfillment of doctors' orders. Many progressive forms of labor organization in hospitals will be tested in an experiment that began this year.

All types of medical services will be further developed and improved. Special significance is given to the realization of a state program to battle cardiovascular disease. During the years of the five-year plan it is planned to organize 73 cardiac health centers, to continue the development of cardiology offices in clinics and hospitals, to increase the number of emergency cardiac brigades and to expand the network of remote consultation centers for EKG interpretation, which will enable us to significantly improve detection of persons with heart disease. Oncological services to the population will be improved by means of building large oncological health centers with inpatient facilities, by expanding the network of centralized laboratories for cytological studies, of endoscopy departments and mammography centers, which will enable us to improve early detection of malignant neoplasms.

Measures are being implemented to improve the quality of stomatological aid, to significantly improve the prevention of stomatic diseases, to diagnose all children and adolescents with regard to the treatment of the mouth, and to satisfy the needs of the rural population for mouth prosthetics. The network of independent stomatological clinics in cities and of departments in urban and rural health facilities will increase. Plans for the 11th Five-Year Plan call for advances in ophthalmology, otorhinolaryngology, psychoneurology, anesthesiology, neurology, neurosurgery, trauma-orthopedics, urology as well as for further specialization in therapeutic and surgical aid. There will be a continuation of the organization of specialized centers (departments) of endocrinology, nephrology, gastroenterology, pulmonic diseases, hematology, allergy, chronic hemodialysis and so forth.

The course toward improving the economic potential of our country and toward fulfilling the Foodstuffs Program, confirmed by the May 1982 Plenum of the CPSU Central Committee, obliges physicians, intermediate medical personnel and all public health workers to multiply their efforts to further improve medical services to agricultural workers. The network of outpatient departments in rural areas will increase, as will mobile types of doctors' services and specialized inter-rayon facilities. Oblast and central rayon hospitals are becoming larger. Measures have been indicated to improve emergency medical aid to rural residents and to develop epidemiological services.

It is essential to increase the responsibility of intermediate medical personnel in medical units, health centers, physician's assistants-midwives centers, and medical clinics in rural areas concerning the entire complex of treatments instituted by them to decrease the incidence of illness and of absence from work, of trauma among workers and employees and kolkhoz and sovkhoz workers.

During the 11th Five-Year Plan pharmaceutical supplies to the population will improve. We must complete the organization of inter-hospital and hospital pharmacies and to create departments of pharmaceutical information in clinics. Great significance is assigned to strengthening central rayon pharmacies as the basic link in providing medications to the rural population of the rayon.

The 26th CPSU Congress pointed to the definitive significance of improving the training, distribution and use of cadres. Measures are being taken to improve the quality of training of specialists, preparing them for independent work. Special importance is attached to improving primary specialization. There are 635 secondary medical schools in the country. They admit 169,000 students. Nurses can also be trained by evening schools. There are two types of training for nurses--general medical nurse or pediatric prophylactic-treatment nurse. The training of intermediate medical personnel is expanding during the current five-year plan, which will enable us to create a better ratio of this personnel to doctors and to improve patient care. The system of improving the training of intermediate medical workers is developing and improving. It includes schools for specialty training of medical workers, courses on various specialties, short seminars on special themes. During the 11th Five-Year Plan we will continue to strengthen the material-technical base of paramedical schools, to supply them with the best teachers. This will raise the level of training of intermediate medical personnel.

Measures are being implemented to improve the system of improving the training of physicians, for the post-graduate training of physicians working in rural clinics, training in emergency medicine of division and shop doctors. Beginning in January of this year physicians will have to be retested periodically (once in 5 years) in order to increase their level of training and their level of responsibility.

In accordance with the decisions of the 26th CPSU Congress and the November 1981 and May 1982 plenums of the party's central committee the efforts of scientists and doctors are being focused on urgent public health problems and on preventive medicine, and on the accelerated introduction into practice of new diagnostic and treatment methods, of new medications and new medical technology. During the 11th Five-Year Plan basic scientific research will be significantly developed, which will enable us to hasten our solutions to the most important medical-biological problems in the struggle against many diseases.

Measures are being taken to realize state programs to develop and introduce into practice effective methods and means of preventing, diagnosing and treating cardiovascular diseases, malignant neoplasms, leukocytic diseases, the primary illnesses of mothers and newborns and psychological diseases. Methods of reconstructive and constructive surgery are improving, as are transplant methods. Devices that take over the function of certain organs are being developed. It is planned to develop a number of departmental programs, in particular on the scientific bases of primary prevention. Together with other ministries and departments the institutions within the system of the USSR Health Ministry and the USSR Academy of Medical Sciences are developing comprehensive

scientific-technical programs. An all-union plan has been confirmed for introducing research results into practice during the 11th Five-Year Plan. It has determined the levels for introducing various new methods and resources in the prevention, diagnosis and treatment of diseases, and leading forms and methods of organizing public health services.

The successful fulfillment of goals established by the 26th CPSU Congress for physicians, scientists, nurses and the entire medical profession depend to a great extent on the efficiency and discipline of each worker in his area of work.

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8228

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PUBLIC HEALTH IN THE VILLAGE

Moscow PLANOVYE KHOZYAYSTVO in Russian No 2, Feb 83 pp 75-79

[Article by N. Malov, department chief, USSR Gosplan, and V. Churakov, deputy department chief, USSR Gosplan: "The Development of Public Health in the Village"]

[Text] The decisions of the May 1982 Plenum of the CPSU Central Committee have determined ways to further strengthen the material-technical base of agriculture and the economies of kolkhozes and sovkhozes, to increase the material interests of village workers, to improve the organization of production and administration and to strengthen specialization and concentration within the agroindustrial complex as well as improve the social transformation of the village.

The resolution of the CPSU Central Committee and the USSR Council of Ministers of 22 May 1982, "On Measures to Further Improve Residential, Communal-Everyday and Social-Cultural Conditions for the Village Population," a complex program for the social transformation of the village was indicated, to include the level of public health in the village. In accordance with this program the first thing that is to be done is to expand the network of ambulatory and clinic facilities, pharmacies and first-aid and emergency medical stations. It is planned to improve the quality of medical and prophylactic services to the village community on the basis of improved work by health institutions, of the accelerated development of mobile rescue units in the village, of providing village health facilities with medical cadres, emergency vehicles, medications and medical technology.

As a result of the realization of extensive measures to improve medical aid to the village population in the USSR, a strong public health system has been developed. In 1980 the country had over 9,000 uchastok hospitals and 82,200 doctor's assistant-midwife stations. The material-technical base of central rayon hospitals has become stronger; the number of such hospitals and their average capacity have grown. In the country there are about 3,800 central and other rayon hospitals. The average capacity of central rayon hospitals in the city is 260 beds; in the village--160 beds. Over 300 central rayon hospitals with urban centers have a capacity of over 400 beds.

The implementation of an extensive program of social transformation in the village has had a positive effect on eliminating differences in health care for the urban and rural populations. Steps have been taken to equalize hospital services for the urban and rural populations. In 1981 23.4 percent of the urban population and 23.3 percent of the rural population was hospitalized. Specialized

medical services were available in over 270 kray, oblast and republic hospitals and 483 specialized hospital facilities located in rural areas as well as in urban hospitals. In 1981 rural dwellers comprised 25.3 percent of the total number of people seeking health care in the hospital facilities of the USSR Ministry of Health system.

With the aim of increasing the number of doctors available to the rural population, beginning in 1983 it is planned to send 16,000-17,000 doctors-graduates of medical higher educational institutes and departments to work in rural health care facilities. The network of pharmacies is developing rapidly in the village areas to improve the supplies of medications for the rural population. In 1981 one pharmacy in a rural area served 7,800 residents; in the city--11,200 residents. The emergency health system is developing the rural areas. During the last 10-11 years the number of departments of emergency medical aid increased more than fourfold. The country has taken the path of developing regular round-the-clock brigades in stations and in departments of emergency medical aid in the centers of rural administrative regions.

Each year there is an increase in capital investments into the building of health facilities in rural administrative regions. During the 11th Five-Year Plan the volume of capital investments for the comprehensive development of agriculture within the public health branch alone should reach 1,016 million rubles (as compared with 699 million rubles during the 10th Five-Year Plan).

The level of outpatient clinic aid to the rural population has also grown significantly during the last decade. However, it is half that in the city. The basic problem in public health development in rural areas is the organization not so much of hospitals but of outpatient clinics and especially of specialized health services to the rural population. In order to eliminate these difficulties it is essential to expand the outpatient network and to improve the organization of outpatient clinic services to the rural population with a consideration of the specifics of rural administrative regions. In accordance with the decisions of the May 1982 Plenum of the CPSU Central Committee, starting in 1983 construction will begin on outpatient clinics in sovkhozes, kolkhozes and other state agricultural enterprises. In 1983-1985 alone 1,950 such outpatient clinics are to be built, with a total capacity of 180,000-195,000 visits per shift.

As we know, medical facilities are being located in rural administrative rayons and according to existing statistical reports these belong to city health facilities (in workers' settlements; cities of rayon^{subordination}; rayon centers located in cities) or to rural facilities (in rural regions). All of them provide medical services for urban and rural residents living in a given rural administrative region. Their classification into "rural" and "urban" creates considerable difficulties in plan management of health care and its development.

It would seem expedient to plan the development of health care in rural administrative regions on the basis of single plan indicators for the region. The availability in statistical reports of data concerning the fulfillment of plans according to the following indicators will enable us to improve planning for the development of a networks of hospital and outpatient clinic facilities in all union republics, krays, oblasts and rural administrative rayons.

List of Planning Indicators for the Development of Public Health in Rural Administrative Rayons.

Number of hospital beds in the republic--total

Including in rural administrative regions

Of these--in central rayon hospitals in rayons with a center:

in a city

in a village

Capacity of outpatient clinics in the republic, thousands of visits per shift--total

Including in rural administrative rayons

Of these--clinics of central rayon hospitals in rayons with a center:

in a city

in a village

Number of physician places, including dentists, in the republic--total

Including in rural administrative rayons

Number of physician places in outpatient clinics in the republic--total

Including in rural administrative rayons

Operational Start:

Hospitals in the republic--total

Including those in rural administrative rayons

Of these--central rayon hospitals within rayons with centers:

in the city

in the village

Outpatient facilities in the republic--total

Including in rural administrative rayons

Of these--clinics of central rayon hospitals in rayons with a center:

in the city

in the village

The importance and scale of goals proposed by the Foodstuffs Program in the area of improving public health in the village presents new demands for the system of planned management of public health, and primarily on the territory of the rural administrative rayon, where the most important links of the agroindustrial complex are concentrated. In our country there is a three-level system for rendering medical aid to the rural population: in the village--level one; in rayon health facilities--level two; in city, oblast, kray and republic health facilities--level three. Special attention is being given to the first two levels of medical service. The creation in rayon centers of the country of public health associations, under the leadership of central rayon hospitals, as a way of organizing specialized medical services for the rural population and of managing public health within the rural administrative rayon secured a significant improvement in the quality of medical aid provided for the populations of the aforementioned rayons.

Acting as a center for the management of public health in the rural administrative rayon and for providing trained specialized medical personnel to village workers, the central rayon hospital administers and controls the activities of all public health facilities located in the rural rayon. This is why the inclusion in the state plan for economic and social development of the aforementioned indicators, characterizing the dynamics of operational starts and the expansion of the network of hospitals and clinics, is a necessary condition

for the planned consolidation of the material and technical base of these important centers of medical aid.

Under the conditions of realizing the Foodstuffs Program of the USSR the development of public health and a methodology for planning it on a rayon level acquire special importance. This refers firstly to the elaboration of the population's needs as concerns health services, the distribution of services at the appropriate levels of health care within the rural administrative rayon. As central rayon hospitals expand and increase their specialized types of outpatient clinics the degree to which health needs are satisfied in the village will approach that of the city. This will be a prerequisite for the introduction of the same standards of need for medical aid among the rural and urban populations.

It would be expedient to consider 12.5 visits to the physician per year per resident as a future normative standard of medical service for the rural population, i.e. to compare the norm to a similar indicator for the urban population. According to this norm the capacity of an outpatient clinic serving 10,000 rural residents should equal 230-250 visits per shift. This normative standard includes nine visits locally, 2.5 visits to central rayon hospitals and other health facilities and one visit to oblast, kray and republic medical facilities. This indicates a need for outpatient clinics serving 10,000 rural residents with a capacity of 175-180, 40-50 and 15-20 visits per shift.

A single standard need for both the urban and rural population as concerns hospitals is 140 beds per 10,000 residents. The given norm is distributed in the following way according to level of medical services: up to 100 beds--within the limits of the rural administrative rayon, i.e. in central rayon, hospitals, dispensaries and other medical facilities; 50-40 beds--in oblast (kray), republic hospitals, clinics and interrayon centers (departments).

At the present time model plans prepared by Giproniizdrav [State Planning and Scientific Research Institute for Health Facilities] and the corresponding organizations of the Moldavian SSR, Ukrainian SSR, Lithuanian SSR and Latvian SSR are being utilized in the building of rural clinics. On the basis of the recommended use norms of clinics by the rural population at level one (the village health facility) and of the size of the rural population, it would be expedient to refer to four categories of facilities when building clinics.

Population, thousands of persons	Capacity of clinic, visits per shift
Up to 4	70
Up to 6	100-120
Up to 9	140-150
Up to 12	190-200

During the current and next five-year plans clinics should as a rule be built in a central location for kolkhozes and sovkhozes, with housing for medical workers.

The necessity to differentially distribute outpatient clinic and hospital funds according to level of medical services and different types of facilities in individual economic regions of the country is based on local economic and geographic features and is predetermined by existing forms of medical services for the population. Whereas in republics such as the Moldavian SSR, the Lithuanian SSR, the Latvian SSR and some others hospital health facilities should in the future be concentrated at the second (rayon) and third (oblast, kray and republic) levels, some republics (RSFSR, Kazakh SSR, Kirghiz SSR, Turkmen SSR, and others) still need local hospitals and outpatient clinics in local areas in the future.

When planning and organizing health services for the rural population it is important to consider the size of the service area, the density of the population, the number of more densely populated settlements and the distance between them, communications and transport facilities, the nature of agricultural production, and other factors. In connection with this we should strengthen the role and increase the rights of executive committees of local soviets of people's deputies, of health ministries of union and autonomous republics, of kray and oblast public health departments and of central rayon hospitals as basic links in the planning of public health services while distributing and differentiating the need of the population with regard to hospital beds and outpatient clinics in individual rural administrative rayons and according to the level of medical services provided for the rural population, to the organizational forms under which they are provided, to the development of a health services network, to the establishment of an operations regimen and to other problems.

The most important principles regarding the improvement of management and planning of health services in rural administrative rayons arise from the resolutions of the CPSU Central Committee and Council of Ministers, "On Measures to Further Improve Public Health," of 22 September 1977, "On Supplementary Measures to Improve Public Health," of 19 August 1982 and "On Measures to Further Improve Living, Communal-Residential and Socio-Cultural Conditions of the Rural Population," of 22 May 1982. These principles call for: an efficient distribution of outpatient clinics and hospitals within rural administrative rayons and providing the rural population with accessible health care facilities; the utilization of a progressive system of norms for planning the development of the material-technical base of health facilities providing services to the rural population; a determination of the capacity and structure of the network of hospitals and outpatient clinics and of the size of the rural population with a consideration of its sickness rate and its need for specific medical aid; supplying hospitals and outpatient clinics with the material, labor and financial resources required to maintain and expand them.

While considering the above principles let us examine a methodology for planning the development and distribution of a network of outpatient clinics and hospitals to provide medical services to the rural population.

The need of the population of j oblast for ambulatory-polyclinic establishments (M_{j^a}) can be expressed in the form of the following mathematical equation:

$$M_{j^a} = \frac{(H_{j^P} + H_{j^C} + H_{j^T} + H_{j^O} + H_{j^n}) A_{j^{CP}}}{307 \cdot 1.6}$$

where H_{j^P} -- size of population living in rayon centers of " j " oblast;
 H_{j^C} -- size of population living in rural areas of " j " oblast;
 H_{j^T} -- size of the population living in rayon cities and urban settlements in " j " oblast;
 H_{j^O} -- size of the population living in the oblast center of " j " oblast;
 H_{j^n} -- size of the population living in the industrial centers of " j " oblast;
 $A_{j^{CP}}$ -- average norm of physician visits made by one urban and rural resident in " j " oblast per year;
307 -- the number of operating days of outpatient clinic annually;
1.6 -- the average number of shifts in these institutions per day.

In further discussions, let $307 \cdot 1.6$ be represented by F_{j^a} .

The formula consists of two parts, one of which $\frac{(H_{j^P} + H_{j^C} + H_{j^T}) A_{j^{CP}}}{F_{j^a}}$

reflects the need of the population within rural administrative rayons of " j " oblast for ambulatory-polyclinic facilities ($M_{j^m}^a$), and the other $\frac{H_{j^O} + H_{j^n}}{F_{j^a}}$

the needs of the populations of oblast and industrial centers of " j " oblast for the aforementioned facilities ($M_{j^o.n.}^a$). The aforementioned needs are characterized by the indicator "number of visits per shift."

The needs of the population of rayon centers for ambulatory-polyclinics and be represented by the formula:

$$M_{j^P}^{ao} = \frac{H_{j^P} A_{j^{CP}}}{F_{j^a}}$$

Because of the fact that the residents of rayon centers can also use the ambulatory polyclinics of oblast centers, the "pure" needs of the population living in rayon centers for outpatient clinics in the rayon can be determined according to the formula:

$$M_{j^P}^{ar} = \frac{H_{j^P} A_{j^{CP}} - H_{j^P} A_{j^P} P_1}{F_{j^a}},$$

¹Where m -- number of rural administrative rayons in " j " oblast (1, 2, 3... m).

where A_j^{p1} -- physician visits in oblast center per single resident living in a rayon center of "j" oblast, per year;

$H_j^a A_j^{p1}$

--the needs of the population of rayon centers in "j" oblast for outpatient facilities in the "j" oblast center ($M_{jc.t}^{ap1}$).

The need for outpatient clinics by the population residing in rural administrative rayons, rayon cities, workers' settlements and rural areas of "j" oblast ($M_{jc.t}^a$) can be expressed in the following way:

$$M_{jc.t}^a = \frac{(H_j^c + H_j^t) A_j^{cp}}{F_j^a} .$$

This need also includes the need of the aforementioned population for outpatient clinics in "j"s" oblast and rayon centers. The former is calculated according to the formula:

$$M_{jc.t}^{aob} = \frac{(H_j^c + H_j^t) A_j^{p2}}{F_j^a} ,$$

where A_j^{p2} -- the number of visits annually to an oblast center by one resident of the rural administrative rayon of "j" oblast (with the exception of the residents of rayon centers and cities subordinate to oblasts and republics).

The latter is calculated according to the formula:

$$M_{jc.t}^{ap} = \frac{(H_j^c + H_j^t) A_j^{p3}}{F_j^a} ,$$

where A_j^{p3} -- the number of physician visits in a rayon center annually by one resident of the rural administrative rayon of "j" oblast (with the exception of the residents of rayon centers and cities subordinate to oblasts and republics).

From this follows that the difference $M_j^a - (M_{jc.t}^{aob} + M_{jc.t}^{ap})$ characterizes the needs of the aforementioned population for outpatient clinics located in cities subordinated to rayons, workers' settlements and rural areas of rural administrative regions in "j" oblast ($M_{jc.t}^{as}$). The sum $M_{jc.t}^a + M_{jc.t}^{ap} + M_{jc.t}^{aob}$ expresses the need of the population of "j" oblast for outpatient clinics in a given oblast center, and $M_{jc.t}^{ap} + M_{jc.t}^{aob}$ expresses the need of the population of rural administrative rayons for ambulatory-polyclinics located in those regions.

The proposed methodology not only enables us to determine the need for ambulatory-polyclinics in rural administrative rayons, but also to approach the problem of optimal distribution of outpatient facilities, clinics and dispensaries in rayons and oblasts. It can also be utilized to calculate the necessary capacity

of outpatient facilities in oblast and rayon centers and in rural areas. By utilizing this methodology and the corresponding use norm for hospitals and the norms and standards for the operation of hospital facilities, it is not difficult to elaborate a model plan developing and distributing a network of hospitals in rural administrative rayons of the oblast, kray or union republic.

In preparing plans for the development of public health services in rural administrative rayons it is very important to determine the relationship between the capacity of the outpatient clinic or hospital and the number of state physician posts and the size of the population being served. This will affect the optimal use of outpatient clinics. At the same time the use of capacities of outpatient clinics, dispensaries and other health facilities will be directly related to the physician function--the load per physician (the number of patients a physician sees in the course of a year). In order to determine the need for physicians it would be expedient to obtain norms according to union republics and levels of medical services per 100 or 1,000 units of capacity per shift in outpatient clinics and beds in hospitals. By having available this type of data, as well as information about the existing network of outpatient clinics and hospitals and about its future development, it is possible to calculate the number of physicians needed for outpatient facilities, clinics, hospitals and even specific regions of the country and various levels of medical services to the population.

The most important part of the public health plan is the indicators for the capital building plan. It is during the beginning period of elaborating the basic directions for the development of the branch that it is expedient to determine the need for the operational start of outpatient clinics and hospitals according to the levels of medical services in rural administrative regions. Here it is necessary to consider replacing old and deteriorating facilities. Data on the need for growth in the aforementioned network of medical facilities can be obtained from the section of the plan on the development of a public health network.

In preparing model plans and elaborating indicators for the operational start of public health facilities in rural administrative rayons, itemised lists of structures from five-year, current and annual plans developed by the councils of ministers of union republics and USSR ministries and departments must be utilized. At the same time, an essential condition for improving planning of public health facilities and the material and technical base in rural administrative rayons is a scientifically-based system of building-norms for regional ambulatory-polyclinic facilities and hospitals.

The application of the proposed methodology will enable us to better calculate the capacity of the outpatient clinic and the hospital facility, to distribute them efficiently and to more fully satisfy the population's needs for medical services.

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MOTHER AND CHILD HEALTH CARE IN THE TATAR ASSR

Kazan' KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 63, No 4, Jul-Aug 82
pp 1-4

[Article by G. A. Bardina, Deputy Ministry of Health of the Tatar ASSR]

[Text] The Soviet state system for child health is improving from year to year. It concentrates in itself all the best that has been achieved by the prophylactic work of our health care. Thanks to the complex of therapeutic and prophylactic measures taken and the continuously rising level of socio-economic conditions, the state of child health in the republic has improved considerably.

The party Central Committee and the USSR Council of Ministers have in recent years adopted a number of resolutions for the further improvement of mother and child medical service and security. A 100% payment of pregnancy and maternity leaves has been introduced for all working women, independently of their work record. The payable leave for care of a sick child has been increased to 14 days.

The mother and child health-care system is an important component in the health-care structure of our republic. In fulfilling party and government decisions, the health-care units and institutions carry out substantial work for the further improvement of pediatric care using the achievements of modern science and practice. A special place is reserved for developing the network of therapeutic-prophylactic institutions, increasing the quality of their work and, also, improving the material-technical base.

The material-technical base of the children's therapeutic-prophylactic institutions in the republic was strengthened appreciably during the years of the 10th Five-Year Plan. Commissioned in Leningorsk were a model children's republic clinical hospital for 510 beds with a polyclinic for 500 visits and a children's hospital for 120 beds with a polyclinic for 300 visits and in Kazan', the children's hospital No. 4; a children's hospital for 300 beds was opened in Naberezhnyye Chelny. Ten children's polyclinics were constructed and commissioned, including three in Naberezhnyye Chelny, five in Kazan', one in Nizhnekamsk and one in the rayon village Aznakayevo. Nine milk kitchens were opened; the milk kitchen in Elabug was moved to a new model building. Forty-two milk kitchens are presently active in the republic.

The children's sanatorium Berezovaya Roshcha and a children's therapeutic were constructed in Kazan', and the sanatorium Aybolit was constructed in Naberezhnyye Chelny.

Considerable attention was given to the child out-patient and polyclinic service. The number of pediatric sections increased to 549 with a 99.8% physician staffing. The provision of rural areas with children's preschool institutions increased by 26.8% during the last Five-Year Plan.

The child health index nearly doubled for both early infant and preschool ages. The morbidity due to dysentery, measles, rickets, nutritional disturbance and pneumonia declined in children's institutions in recent years.

Work is being done to improve the medical service of school children. The number of schools with students attending in a single shift increases annually. Hot meals were provided to 90.2% of the school children in the city and 70-75% in the country.

Examinations by highly specialized physicians are planned. All weakened children are listed with a dispensary. Their amelioration is conducted by specialists in the hospital-polyclinic network.

The provision of the population with children's beds increased to 20.1 per 10,000 people. Particular attention is given to improving the structure and organization of the forms of work in children's hospitals and, also, creating special departments and wards for rehabilitation and intensive therapy. Considerable work has been done to provide children's hospitals with medical equipment and apparatus. All this, without a doubt, influenced the parameters. Hospital mortality stabilized at the 0.7% level in the city and 0.3% in the country.

The specialized women and child medical care continues to expand and is now provided at all levels: in the polyclinic, at home and in the hospital. The relative importance of specialized beds among the total number of pediatric beds comprised 21.8%. An interrayonal department of the second level is now successfully operating in the republic on the basis of the children's hospital in Al'met'yevsk for the care of premature children from rural areas, and has markedly reduced the child mortality parameters during the perinatal period in the involved rayons.

The demand for specialized beds for newborns will be fully met with the opening of children's hospitals in 1982 in Kazan', Naberezhnyye Chelny and Nizhnekamsk.

There are 367 beds to provide hospital surgical care to children in the republic. Specialized departments have been organized for thoracic surgery, chest and cardiovascular surgery, traumatology, orthopedics, rehabilitation and anesthesiology. Independent child surgical departments are active in Kazan', Naberezhnyye Chelny, Zelenodol'sk and Leninogorsk, and children's wards function within adult surgical departments in Al'metyevsk, Chistopol', Bugul'ma, Bavly, Elabug and Nazhnekamsk. Functioning in polyclinics are 28 child surgery, 7 orthopedic-traumatological, 3 child urology and 1 uronephrology clinic, in which 40 children's surgeons work. A second interrayon center on questions in child surgery was opened in 1980 in Leninogorsk.

Republic and interrayonal scientific-practical conferences and seminars are regularly held on problems in child surgical pathology. Organizational-methodological supervision and therapeutic-consultative assistance is rendered by the interoblast child-surgery center, based at the children's republic clinical hospital. A unified system of child uronephrological care has been created and introduced in the republic.

In those rayons where there are no children's surgeons, physicians have been assigned who are responsible for organizing and delivering surgical care to children and who are underdoing training at the surgical departments of the children's republic clinical hospital in a planned sequence. All this promoted decline in child mortality due to surgical pathology from 1.7% in 1977 to 0.6% in 1981.

A city rehabilitation center was organized in 1981 on the basis of the children's republic clinical hospital with a mobile rehabilitation-consultative brigade for Kazan'. Sixteen forms of specialized care are provided in the out-patient and polyclinical institutions of the cities. In connection with the fact that more than 50% of the children of up to seven years of age are raised in pre-school institutions, a network of specialized institutions was created in our republic for children with defects in physical and mental development, hearing, speech and vision impairments and allergies. This new direction in the practice of medical-care delivery to children of preschool age makes it possible to combine child raising with the delivery of highly-qualified medical care. At the present time there are 12 specialized children's institutions containing 859 people and 132 specialized groups that cover 2,569 children. The children's republic clinical hospital, as an organizational-methodological and consultative center for specialized service, includes a polyclinic for 500 visits. Patient-reception by specialized physicians with various specialties is conducted in the polyclinic: allergy, neuropathology, gynecology, rheumatology, otolaryngology, ophthalmology, surgery, urology, logopedics, nephrology, psychoneurology and surdology. The polyclinic has a well-equipped laboratory and an office for functional diagnostics. The otolaryngological department of the children's republic clinical hospital is a hearing-rehabilitation center for the republics of the Volga region and Kirov Oblast.

The specialization of women's consultation clinics and maternity homes (departments) has in recent years become a characteristic feature of their operation. Specialized reception stations for women have been opened in the nine women's consultation clinics in Kazan' and in nine cities of republic subordination, they are for treating infertility, for prophylaxis of premature birth, childhood-age gynecology, endocrinological disorders of menstrual function and contraception.

Mobile brigades have been organized from women's consultation clinics attached to maternity houses in the cities of Nizhnekamsk, Leninogorsk, Bugul'ma and Zelenodol'sk and the worker's settlements of Aznakayevo and Bavla in order to improve further the specialized medical care for women in the republic's obstetric-gynecological service. The brigades, which include a paramedical gynecologist, stomatologist, internist, otolaryngologist and laboratory technician, travel to rural rayons and uchastok hospitals following an advance schedule.

Most of the maternity homes in Kazan' are specialized in one or another field of obstetric pathology in combination with extragenital diseases.

The obstetrics and gynecology departments of the Kazan' Medical Institute and the State Advanced Training of Physicians Institute are consultative-methodological centers in the corresponding pathology for women's consultation clinics in Kazan' and the republic. Centers for consultation and for toxoplasmosis were created in the Tatar ASSR in 1980.

The specialization of obstetric and child therapeutic-prophylactic institutions facilitated the improvement of the women and child medical service. Thus, during the years of the 10th Five-Year Plan the parameters for maternal mortality declined by 18% in the cities and by 52% in the village, natimortality declined by 7.7% in city locales and 21.5% in the villages, perinatal mortality by 3.7% in the cities and 25.6% in the villages and infant mortality rate by 9.6% in the cities and twofold in the villages. All this had a positive influence on child health parameters and reduced child mortality by 15.9%.

Considerable successes in the struggle for the health of the younger generation have resulted from the enhancement of the well-being and cultural level of the people, as well as the practical introduction of scientific achievements. Rheumatism and heart-disease morbidity and the number of their relapses declined. Rheumatism mortality in hospitals declined by 40% relative to 1976.

Especially tangible have been the results of the struggle with child infections--dysentery, whooping-cough, measles and pneumonia morbidities declined markedly among children of the first year of age, and, also, nursery morbidity fell.

The structure of causes of child mortality changed appreciably. Whereas earlier, diseases of the respiratory organs were predominant among other diseases, in recent years diseases of the perinatal period have been dominant in the republic.

Child mortality at home declined by 35.7% relative to 1979; perinatal mortality in the villages, by 28.8% and, including children of the first year of life, by 42.6%. There was no child mortality at home in Kuybyshevskiy, Muslyumovskiy and Pestrechinskiy rayons. The republic's health care units are faced with an important task of further reducing child mortality. A serious research and organizational effort must be directed at improving the entire pediatric service. Continuous observations of children in the first year of life and active prophylactic measures have already resulted in liquidation in the republic of the severe forms of rickets and hypotrophy.

In recent years ever increasing attention has been given to improving the working conditions of uchastok pediatricians, and pediatric uchastoks have been subdivided. Today the cities of Kazan', Zelenodol'sk, Chist opol', Leninogorsk and Al'met'yevsk and the worker's settlements of Kamskoye Ust'ye, Mamadyshskiy and Tetyushkiy have pediatricists for an average of 800 children in a uchastok.

In order to increase the quality and standard of the medical service of the child population in the republic, base institutions have been created in recent years in various sectors of women and child health care which will serve as a graphic model for the correct organization of therapeutic-prophylactic child care. The necessary technical literature has been assembled in them, new materials for serving children are developed, newly-hired medical workers are trained and, also, republican seminars are held for the various medical-worker categories to propagandize advanced types of work. We have four such centers of republic significance. They have hosted more than 100 medical workers since 1978.

The base of advanced experience in premature-infant care affiliated with Al'met'yevsk Children's Hospital was featured at the USSR Exhibit of Achievements of the National Economy and was awarded a bronze medal.

Officers for healthy-infant and pre-physician reception have already been introduced in a number of polyclinics as advanced forms of work; a preliminary list is made for specialist receiving and an automatic appointment list for house calls; communication points have been organized between polyclinics, hospitals, emergency care and maternity homes, which inform each other concerning ill and healthy children; centralized instrument sterilization has been introduced; vaccination planning for the child population has been centralized in the service zone of paramedic-obstetric points; mobile women's consultation clinics operate in a number of rayons.

Various child diseases--rheumatism, anemia, rickets, respiratory-organ pathology, allergies, etc.--are subjects for research by the republic's scientists.

A broad program of activities directed at reducing morbidity and improving the prophylaxis, diagnosis and treatment of diseases can be implemented only by putting into practice the latest achievements of science and the experience of advanced collectives. "The practical introduction of new ideas," said L. I. Brezhnev at the CPSU 25th Congress, "is today a no less important task than development."¹

The rational use of existing therapeutic-prophylactic institutional bases, the practical introduction of the achievements of modern science and the effectiveness of therapeutic and prophylactic measures in many ways depend upon the level of training and initiative of medical-institution supervisors, upon the qualifications and drive of physicians and middle medical workers.

At the present time the various forms of specialization and advanced training involve all physicians and, primarily, department and consultation-clinic chiefs, rayon pediatricians, obstetrician gynecologists and neonatalists. The number of certified pediatricians has increased considerably: by up to 31.6%, including up to 39.6% for uchastok pediatricians and up to 34% for obstetrician-gynecologists.

¹. Materials of the CPSU 25th Congress, Politizdat, Moscow, 1976, p 48.

owever, the republic's medical workers have realized far from all possibilities for increasing the effectiveness and quality of the medical service of the child population, for reducing the level of morbidity and mortality and conducting the necessary prophylactic measures. There are serious deficiencies in the republic that negatively influence the state of women and child health. A well-defined system for conducting the antenatal protection of the fetus has not yet been properly designed in a number of rayons. There is still no late receiving of pregnant women in women's consultation clinics. The prophylactic beds assigned for pregnant women with pathology are insufficiently utilized. Little attention is given to the nutrition of pregnant and nursing mothers. All these defects are a cause of the development of various pathology in newborns.

Questions of the protection of the health of working mothers are of special significance in our work. We are guided in this direction by the USSR Ministry of Health Order No. 1,000 "Protection of Women's Health". Annually at the Tatar ASSR Supreme Soviet Commission, the Tatar ASSR Ministry of Health Collegium and at official conferences, three to four rayons are heard on questions in the health care and social security, the work and life of women.

This sector of activity requires more intense study jointly with the Oblast Trade-Union Council and the republic Sanitary Epidemiological Station.

The morbidity from influenza and acute respiratory-viral diseases continues at a high level among children attending preschool institutions. One reason for increased morbidity is the overexhaustion of groups, which leads to disruptions in the daily routine; ventilation, the organization of walks, hardening and, primarily, quality prophylactic observation of the children and the enhancement of the protective forces of the child's body are of decisive influence in reducing child morbidity.

An inadequate operation of pediatric beds has been noted in the city, which is a consequence of the poor compartmentalization of departments; the relative importance of pediatric beds in the republic corresponds to only 22.7%.

The available network of milk kitchens does not provide for the nutrition of needy children in the requisite volume.

All possible measures must be undertaken for reducing morbidity and child mortality--the establishment of the personal responsibility of each physician pediatrician for his own division, broader involvement of the entire medical service in protecting the life and health of children, activation of the work of sanitary personnel, the performance of a broad educative work among the population.

All efforts of medical workers are at the present time directed at the earliest resolution of urgent questions in contemporary health care, which will assist the workers of our republic to carry out successfully the resolutions of the 26th Party Congress.

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CHARACTERISTICS OF TOXICOSIS DURING HYPERVITAMINOSIS D

Kazan' KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 63, No 4, Jul-Aug 82
pp 71-72

[Article by A. G. Loseva, Leningrad]

[Text] Hypervitaminosis D is one of the serious complications that can develop as a result of the treatment or prophylaxis of rickets in children of an early age. Along with the moderate, medium-severe and severe toxic forms of the disease are noted. The moderate forms often remain undiagnosed; patients with the severe form, as a rule, are sent to the hospital.

In many cases the clinical picture of hypervitaminosis D is identical in its symptomatology (sharply-pronounced toxicosis, exsiccosis, persistant vomiting, anorexia) to the clinical picture of acute intestinal diseases. On the basis of our own experience, we have developed a differential diagnosis for these externally-similar forms of pathology.

First of all, during hypervitaminosis D, the development of the toxicosis (usually against the background of antirickets therapy) is preceded by a more or less prolonged period during which certain changes occur in the state of the child: appetite declines, weight gain slows or ceases, vomiting and a tendency for constipation develop. The children become more difficult and sluggish. It is important to note that the symptoms of rickets during this time not only do not decline but sometimes, on the contrary, increase, which often leads to a mistaken judgement concerning the insufficient effectiveness of the earlier-employed dose of vitamin D. In this case, an increase in the intensity of treatment accelerates the development of severe toxicosis.

A series of symptoms are found clinically at the height of pronounced intoxication which are characteristic of D-vitamin intoxication.

1. During hypervitaminosis D the skin acquires a pale-grey coloration with a yellow hue in the fold regions. During intestinal toxicosis (toxic dyspepsia, colitis, toxic form) the skin is pale with a light bluish (cyanotic) hue, which is a result of a disruption of hemodynamics.

2. A difference is also noted in the coloration of the mucous membranes: the mucous membrane of the lips is cyanotic during hypervitaminosis D; it is of a bright-red color during intestinal toxicosis.

3. The principal symptoms appear differently with respect to the gastrointestinal tract. A gastritic syndrome is in the forefront during hypervitaminosis D. Persistent vomiting develops in the child after each time food is taken, after each drink of water and independently of them. At the same time, the stool is retained or increases slightly to up to three to four times per day, is semi-fluid or of a chyme-like consistency and contains mucous and a green color.

During toxicosis caused by intestinal disease, along with intensive vomiting the stool is very frequent and is fluid or watery with a scant quantity of fecal masses. The feces may contain a small admixture of mucous, but the more frequent and fluid the stool, the more rarely the mucous admixture appears, which is explained by astrophia of the mucous glands. The fecal masses sometimes seem mucified due to the content of a large quantity of fat (neutral fat, fatty acids).

4. A highly important differential symptom of these two similar pathological states are changes on the part of the urinary system. During hypervitaminosis D, in spite of the appearance of exsiccosis, of large fluid loss due to vomiting and of sharp restriction of fluid intake by way of the mouth, diuresis increases sharply, which is related to an early lesion of the kidney tubule system and the disruption of reabsorption. Diuresis declines during intestinal diseases against a background of pronounced toxicosis and exsiccosis.

In urine analyses during hypervitaminosis D there are frequently found protein and the leukocytes characteristic of pyelonephritis, which are detected for an extended time. During toxicosis associated with acute intestinal diseases, no deviations are determined in urine analyses, or protein traces, isolated erythrocytes and casts (toxic changes) are noted in one to two analyses at the height of toxicosis.

5. On the part of the cardiovascular system, a distinct systolic murmur is sometimes heard during hypervitaminosis D against the background of dulled heart tones. Arterial pressure is elevated.

During toxicosis against the background of acute intestinal diseases, the tones are dulled; there is no murmur. The arterial pressure is elevated during the hypertonic type of exsiccosis. During hypo- and isotonic exsiccosis, it is normal or depressed.

6. The picture in the peripheral blood is also indicative. Leukocytosis and neutrophilia and an increased ESR [erythrocyte sedimentation rats] are pronounced during hypervitaminosis D.

During acute intestinal toxicoses the quantity of leukocytes remains normal or is slightly increased, neutrophilia is pronounced, while the ESR is normal or below normal.

To confirm a diagnosis of hypervitaminosis D the anamnestic and all data predisposing factors for the development of that pathology should be considered. Furthermore, the Sulkovich test, which is positive and sharply positive, should be conducted. The quantity of phosphorus in the blood serum is depressed; the calcium level can be elevated or normal.

Results of our investigations can be used for early diagnosis of the disease and, thus, timely implementation of a pathogenetic therapy.

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PERSONAL PHYSICIAN IN THE VILLAGE

Moscow PRAVDA in Russian 14 Feb 83 p 3

FRANTSEN, O., special correspondent, Lithuanian SSR

[Abstract] A two-story village dispensary in the village of Zhezhmaryay, close to the Vilnyus-Kaunas highway, represents future trends in medical services in Lithuania. The attractive building, with a staff of 21 medical personnel, can meet most medical needs of the local population and requires at the most only a two-three hour travel time from the most remote area, while a visit to the central Kayshyadorskiy rayon hospital requires five hours at a minimum. Quarters are available next to the clinic for the medical personnel and constitutes an attractive feature for retaining qualified individuals. Because of the local nature of the dispensary there is virtually no waiting, the physicians and the patients know each other and their particular problems, and the druggist has at hand a wide variety of medicinal herbs collected for the dispensary by the adults and schoolchildren.

[317-12172]

MORTALITY ANALYSIS AMONG CHILDREN CAUSED BY BURN TRAUMA

Frunze ZDRAVOOKHRANENIYE KIRGIZII in Russian No 4, Jul-Aug 82 pp 47-49

BAYZAKOV, U. B., CHURAKAYEV, V. D. and DYUSHENALIYEV, B. D., Burn Division RKB [unknown abbreviation]

[Abstract] Burn trauma in children results in more complicated pathophysiological disorders than among adults with comparable degree of burned area. This is due to irreversible changes occurring in internal organs. It was established that the mortality among burned children depends on age and the degree of burn as well as on the total area involved. Specifically, burn related mortality among children under 5 years of age is 3.5%, among those 6-10 years old - 1.3% and in the 11-14 years group - 0.4%. Children with 10% of their body surface burned (II-IIIA degree) have a 1.6% mortality rate which goes up to 45% when 30% of body surface is involved. Most often the burns are due to boiling water (45%), flame (37%) and steam (4%). Small children suffer

greatly from burn shock, which often is not recognized in early stages. A series of recommendations were given for treatment of burn cases, including treatment for shock in all cases with over 5-7% of body surface involved, followed by control of infections, closing of any wounds and finally transfusion therapy.

[229-7813]

CONFRONTATION WITH AGING DISEASE

Leningrad LENINGRADSKAYA PANORAMA in Russian No 11, Nov 82 pp 16-18

ALMAZOV, V. A., chief cardiologist of Leningrad, professor, corresponding member, USSR Academy of Medical Sciences

[Abstract] An interview between V. A. Almazov and N. G. Volynskiy on the subject of the development of cardiologic service in Leningrad is reported. As late as 1909 myocardial infarction was considered a rare diseases in the Soviet Union, but as early as the 30's, cardiology developed as an independent science thanks to the efforts of G. F. Lang, Leningrad's cardiologist. The reason for this rapid growth was an increased intensity of life style, urbanization, higher civilization. This disease attacks individuals of economically developed countries, gradually creeping down in respect to age of onset. Paradoxically, this may be due to improved standard of living, higher caloric intake, less exercise and gradually diminishing exercise due to the development of automotive mobility. In addition, smoking, alcohol and stress all add to the problem. In Leningrad, cardiac service was introduced in 1957, but it was designed to only verify the diagnosis and to refer the patient to a hospital. A real cardiac emergency service was introduced in 1977 including a 24 hr diagnostic service with ambulances equipped with EKG. Cardiac care beds have been increased. In the near future 20 cardiologic brigades will be operational. The main thrust should be aimed at prophylaxis through detection of high risk group among school age children. It is stated that 80% of cardiac patients return to their work after a rehabilitation program. Mortality does not go up, it even drops somewhat in select areas.

[229-7813]

RADIATION BIOLOGY

ASSURING RADIATION SAFETY IN USE OF NUCLEAR POWER IN NATIONAL ECONOMY

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 9,
Sep 82 pp 39-42

SCHTREGOBER, VIL'GEL'M, SEV Secretariat

[Abstract] The USSR has shared its advanced nuclear power technology with other member countries of the SEV [Council of Mutual Economic Assistance] and enabled them to create their own research centers, train their own engineers and scientists, and construct nuclear power plants and develop industries utilizing various radio-nuclides. One natural concern with the extensive use of nuclear power and various radioisotopes in the various spheres of economic activity is that of radiation safety. In this regard the SEV countries have formulated a plan of action to allay any fears on the part of the populace and to insure the highest degree of safety, which calls for monitoring and determining the effects of radiation on man, evaluation of radiation risk factors, establishment of acceptable maximum doses, and the development of an administrative system to carry out effective overview. An important aspect of this endeavor is the determination of the contribution of man-made installations and radionuclides to the human radiation load. To date it has been determined that the total contribution of atomic installations to the human radiation dose is 0.15%, as compared to 68% from natural background radiation and 30% attributable to medical intervention.

[289-12172]

- END -